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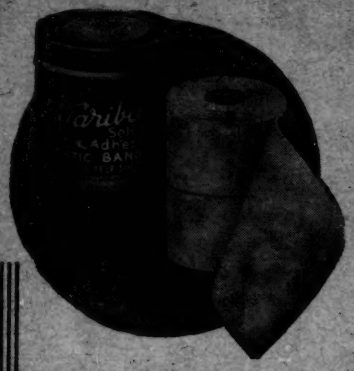

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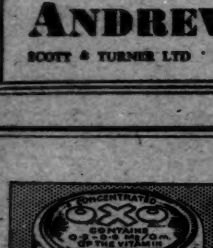

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 8 1945

MENINGITIS AFTER SPINAL ANALGESIA

BY

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Major, R.A.M.C.

(From a Neurosurgical Unit of the M.E.F.)

The possibility of introducing infection into the subarachnoid space by spinal tap has been recognized from the time that lumbar puncture was first performed, and this possibility must be considerably increased if anything is injected into the theca. Though Babcock (1932), when reviewing the causes of death following spinal analgesia, says meningitis is extremely rare, it is probable that the percentage of infections is higher after this procedure than after any other necessitating lumbar puncture. The literature would appear to support the infrequency claimed by Babcock, for only scattered references can be found, but this may be accounted for by a natural reluctance to report what should be a preventable happening.

Six cases of meningitis after simple lumbar puncture have been described. Siebert (1922), Spiller and Payne (1924), Symonds (1925), and Reynolds and Wilson (1934) gave the details of this group, in which one death occurred.

After spinal analgesia there are more frequent reports. Barrie (1941) describes 11 cases with one death in 96 consecutive spinal analgesias in three months. Livingstone, Wellman, Clark, and Lambros (1943) describe 2 cases which they label "aseptic chemical meningitis," and quote 8 further cases with three deaths from the earlier literature. Evans (1945) gives an account of two deaths from such a meningitis, but does not indicate whether these were the only cases or whether they were the fatalities in a series. The clinical details of all these cases are scanty, and for this reason the group below is reported.

If infection is introduced along a needle track it may obviously lodge anywhere in the course of that track. With lumbar puncture the possible localities are the skin, subcutaneous tissues, vertebrae, epidural space, and subarachnoid space. Each localization gives a fairly typical clinical picture. In this paper are reported seven cases, occurring in the Middle East, of infection of the subarachnoid space after spinal analgesia. One of these patients died, and a post-mortem examination was carried out. Because of its importance in the argument on aetiology and pathogenesis a precisely similar case following diagnostic lumbar puncture is included. The clinical course of this condition is so prolonged that only the first case is given in full detail. The others are briefly summarized. For ease of comparison the C.S.F. findings are collected in the accompanying Table.

Case I: Male aged 22

Jan. 9, 1942.—Herniotomy was performed after the administration of 13 c.cm. of nupercaine. He remained well for seven days and then headache and pyrexia occurred, but it was not until Jan. 29 that he developed clinical meningitis—confirmed by lumbar puncture (Table, L.P.1). Sulphapyridine was given with apparent improvement, but he relapsed very soon. These remissions and relapses continued in spite of treatment, and the patient was transferred to the neurological unit on March 4. He was then fairly well and had a positive Kernig's sign as his only abnormality. On March 18 he relapsed (L.P.5) and was given a course of sulphathiazole. No real improvement occurred (L.P.6), and the next relapse on March 26 was treated with sulphadiazine.

March 29.—Felt very much better. No headache and temperature settled. Neck and back felt easier (L.P.8).

April 1.—He had been very well until the early hours of this morning, when he had a sudden onset of severe renal colic, more marked on the left, with haematuria. The total dosage of sulphadiazine was 100 g., and no more was given. The patient was put on a glucose-saline intravenous drip and given 1 dr. of sodium citrate by mouth every three hours. As no urine was passed between 10 a.m. and 6 p.m., the ureters were catheterized by Lieut.-Col. Ogier Ward. Small clots protruded from the ureteric orifices, and the renal pelves were washed out with bicarbonate solution until the return was clear. After this his urine became normal.

April 3.—He now felt fine and had no complaints apart from slight stiffness in the legs (L.P.9).

May 17.—Until this date he continued to improve apart from residual stiffness in the legs. He developed a headache in the night, and temperature rose to 102° F. On examination no physical signs could be made out—certainly nothing to suggest a recrudescence of meningitis. This settled after two days.

May 25.—Blood count: R.B.C., 4,510,000; Hb, 85%; W.B.C., 10,200, differential normal. B.S.R. (Westergren): Fall in one hour, 48 mm.; in two hours, 81 mm.

The B.S.R. indicated that some active infection was still present, and three days later he again complained of severe pain in the head which was both retro- and supra-orbital. He also had pain in the neck and lower back, going down the backs of both thighs and legs. He had two further relapses, which appeared to respond to sulphadiazine, but by June 16 (L.P.10–13) the lumbar punctures suggested the infection was sealing itself off in the spinal canal. Every now and again apparently a pocket leaked into the general subarachnoid space and there was a recrudescence of the general manifestations. This loculation could be regarded as a stage of lumbar arachnoiditis, and it might account too for the failure to clear completely with sulphadiazine therapy. The drug appeared capable of dealing with the infection when it was generalized in the spinal theca, because this settled more rapidly with than without treatment. The presence of loculation was supported by the poor response to jugular compression and the rise in C.S.F. protein without a corresponding rise in cells. Support for this theory was also given by the symptoms, which were mainly confined to the back and legs and persisted even when the patient was otherwise fairly well. It was decided that the next time lumbar puncture was carried out a simultaneous cisternal puncture should be done and the fluids compared. Any significant difference would indicate that the theory was possibly correct. This was done on June 19 (C.P.14 and L.P.15). Macroscopically the two fluids were very different and, with the laboratory findings, supported the diagnosis of infection confined mainly to the lumbar subarachnoid space with partial blockage of C.S.F. circulation. It was now suggested that, owing to the block, the sulphadiazine did not reach the infected area in reasonable concentration, and it was decided to put a weak solution of the drug into the lumbar theca. The danger of using sulphonamide derivatives by that route was well known, but it was felt that this was due to the great alkalinity of ordinary solutions, and carefully neutralized 1/4% sulphadiazine was used. The *p*H of this was just above 8, and 20 c.cm., containing 50 mg., was injected by lumbar puncture. No untoward reaction occurred.

June 29.—There had been no local or general reaction and the patient felt much better, but could not bend his back with ease and the back of both thighs felt stiff (L.P.16).

July 7.—In the past week the patient had been feeling rather better, but on this day had more local pain in the back. There was no tenderness or redness over the lumbar spines. The legs felt stiffer, but there was no neck stiffness (L.P.17). 20 c.cm. of 1/2% (100 mg.) sulphadiazine solution of *p*H just over 8 was introduced into the lumbar theca No reaction of any kind occurred.

July 13.—The patient had been very well during the past week. He thought his back and legs were less stiff. Again simultaneous

cisternal (18) and lumbar (19) punctures were carried out. These indicated that, temporarily at any rate, the local introduction of weak sulphadiazine solution had cut down the infection, though the rise in protein was a little disturbing. There was certainly no clinical evidence of gross damage to the spinal cord, nerves, or membranes. No sulphadiazine was present in either fluid.

July 17.—(L.P.20.) The rise of protein indicated either further obstruction by adhesions in the spinal arachnoid space or a reaction locally to the sulphadiazine.

July 24.—He had a sudden onset of headache and his temperature rose to 101°, but there was no neck stiffness or any increase of leg stiffness (L.P.21). After this he was given sulphadiazine by mouth in a three-day course of 10 g. daily. This was to be repeated each week for four weeks.

Table showing C.S.F. Findings in Case I

	Date	Route	Pressure	Jugular Compression	Appearance	Protein mg./100 c.cm.	Polymorphs per c.mm.	Lymphocytes per c.mm.	Film	Culture
1	29/1/42	L.P.	150	Free rise	Turbid	90	400	1,600	Nil	Sterile
2	5/2/42	L.P.	160	"	Opalescent	80	50	450	"	"
3	26/2/42	L.P.	140	"	Turbid	100	3,200	600	"	"
4	9/3/42	L.P.	190	"	Opalescent	70	750	350	"	"
5	18/3/42	L.P.	200	"	Turbid	90	1,500	500	"	"
6	23/3/42	L.P.	240	"	Opalescent	90	510	220	"	"
7	26/3/42	L.P.	200	"	"	85	460	170	"	"
8	29/3/42	L.P.	160	"	"	60	70	45	"	"
9	3/4/42	L.P.	170	"	Clear	40	—	25	"	"
10	31/5/42	L.P.	200	"	Turbid	120	2,800	480	"	"
11	5/6/42	L.P.	130	"	Clear	50	28	16	"	"
12	13/6/42	L.P.	120	Poor rise	"	85	—	2	"	"
13	15/6/42	L.P.	150	Very poor rise	Opalescent	150	80	320	"	"
14	19/6/42	C.P.	90	Free rise	Clear	65	12	48	"	"
15	19/6/42	L.P.	70	No rise	Opalescent	100	650	600	"	"
16	29/6/42	L.P.	100	"	Clear	100	24	16	"	"
17	7/7/42	L.P.	100	"	Opalescent	120	160	40	"	"
18	13/7/42	C.P.	100	Free rise	Clear	90	—	15	"	"
19	13/7/42	L.P.	80	Slight rise	"	95	—	2	"	"
20	17/7/42	L.P.	140	No rise	"	200	5	5	"	"
21	24/7/42	L.P.	150	Slight rise	Opalescent	85	410	270	"	"
22	31/7/42	L.P.	100	"	Hazy	40	36	24	"	"
23	23/8/42	L.P.	150	Slow rise	"	100	150	100	"	"
24	31/8/42	L.P.	140	"	"	80	77	33	"	"
25	7/9/42	L.P.	120	Moderate rise	Clear	90	28	7	"	"
26	14/9/42	L.P.	130	Free rise	"	70	—	20	"	"

L.P.22 and 23 were done on July 31 and Aug. 23. It was disappointing to find the persistence of infection when the four-weeks course had been completed. The possibility of washing out the lumbar theca as described by Symonds (1925) through high and low lumbar or through cisternal and lumbar needles was discussed, but it was decided to postpone this for the present, and to give another intrathecal dose of sulphadiazine at the next lumbar puncture.

Aug. 31.—(L.P.24.) 20 c.cm. 1/2% sulphadiazine (100 mg.) was given intrathecally. Within half an hour there was a reaction, with severe pain in the back which spread up, and in one hour there were severe headache and neck stiffness. The temperature rose to 102° four hours after the injection and there was definite head retraction. Vomiting began about two hours after the injection and continued for ten hours. The patient said that he had not had so severe a headache or pain in the neck or back since the original onset of meningitis. He required 1/4 gr. morphine and 1/100 gr. hyoscine in the night for the relief of pain and headache.

Sept. 1.—The headache, neck stiffness, and backache had now gone and the temperature was normal. Apart from feeling limp, the patient said he was not too bad. Examination showed no physical signs apart from lower back and thigh stiffness. The sulphadiazine solution was investigated, and it was found that the *p*H on this occasion had been tested with a colour indicator which had deteriorated and that the *p*H might actually have been as high as 9. On the previous occasions the *p*H had been determined with the hydrogen electrode. The reaction produced in the patient was therefore due to the alkalinity of the solution, and was a true irritation of the arachnoid giving a meningitic picture.

Oct. 24.—The last two lumbar punctures were done in September, and during the past month the patient had been very well. There had been no pyrexia for six weeks and, apart from a minor bout of furunculosis, no untoward happenings. He walked well, but his legs tired very rapidly. Examination showed no physical signs in any system beyond a limitation of straight-leg raising to 45°. The other systems were normal. B.P., 130/90. Urine: Sp. gr., 1020; no albumin, sugar, or casts present. Blood urea, 32 mg. per 100 c.cm. Blood count: R.B.C., 4,750,000; Hb, 85%; W.B.C., 9,000, with a normal differential. Sedimentation rate (Westergren) normal.

Eight months later this patient was very well apart from stiffness of the lower back and thighs. He still tired very easily. These were his only symptoms and the only signs of damage to the cauda equina.

There can be little doubt that this man had had a lumbar obstruction to the flow of the C.S.F. which cleared spontaneously. It is difficult to see why there had been a completely free period of six weeks after the initial treatment with sulphadiazine. The generalized meningitis had disappeared, either naturally or as a result of treatment, but the recrudescence proves that pocketing had already occurred. The clearing of the spinal obstruction was also seen in later cases. It is probable that in this spontaneous disappearance of adhesions an occasional pocket of infection is liberated into the general subarachnoid space. The continuation of infection in the pockets suggests that the sealed-off areas cannot be reached by chemotherapy. It is possible, however, that these pockets contain sterile pus and that the clinical manifestations are due simply to the liberation of this irritant material into the general subarachnoid space.

Case II : Male aged 25

On Sept. 9, 1942, appendicectomy was carried out under spinal analgesia, 13 c.cm. of light percaine being used. The appendix was acutely inflamed. The patient had a continuous pyrexia after the operation, and three days later complained of some pain in the back, for which no cause was found. It was not until Sept. 21 that there were any clinical signs of meningitis, but the local tenderness prevented any punctures being carried out. He was started on sulphadiazine and began to improve, only to relapse exactly as the previous patient had done. He was transferred to the neurological unit on Oct. 3. He then had an obvious clinical meningitis, but was very tender over the lumbar spine. This suggested a possible osteomyelitis of the spine or a spinal epidural abscess. Skiagrams of the spine were negative, and a cisternal puncture confirmed the meningitis. The back soon settled and lumbar puncture as low as possible showed a free flow of fluid, thus negativing a large epidural abscess, which would have caused an obstruction. This patient did not respond to sulphadiazine, having many remissions and relapses. Several transfusions were given because the haemoglobin was falling, but with only temporary improvement. By the middle of November his condition had deteriorated greatly; it was obvious that spinal block had developed, and on Nov. 27 intrathecal sulphadiazine accurately buffered was given. This was repeated on three occasions. In spite of the C.S.F. improvement there was no clinical progress, and early in December he had passed into a state of akinetic mutism with definite papilloedema. As in spite of the spinal block the C.S.F. protein remained relatively low it was felt that this block must be very high up. On Dec. 18 the left lateral ventricle was tapped through a burr-hole. Instillation of methylene blue followed by cisternal and lumbar punctures showed that the block was below the cisternal level. In spite of ventricular tapping his condition deteriorated, and on Jan. 8, 1943, as he was moribund, 2,000 units of calcium penicillin were instilled into the ventricle. This produced no clinical change, but his C.S.F. now gave a profuse growth of *Ps. pyocyanea.* He died on Jan. 11.

Post-mortem Examination.—This was carried out by Capt. A. D. Morgan, R.A.M.C. *External appearances :*—The body was that of a pale and extremely emaciated young man. The right pupil was dilated. In the right iliac fossa was a healed surgical wound. *Spine :*—The muscles in the lumbar region were rather juicy, but there was no evidence of extradural abscess or osteomyelitis. The C.S.F. in the lumbar theca was yellow, turbid, and under pressure. The dura mater was slightly thickened and the pia-arachnoid inflamed throughout. Over the thoracic segments of the cord was a thick yellow exudate causing fairly firm adhesions between dura and cord.

In the meshes of these adhesions lay pools of turbid C.S.F. Over the posterior aspect of the lower medulla were numerous small subpial haemorrhages. *Head and contents :*—High in the left parietal bone was an exploratory burr-hole. The dura and its venous sinuses were healthy. The brain surface was dry and the gyri were flattened. A thick fibrino-purulent exudate was observed over the base of the brain; elsewhere the meninges were congested. A moderate degree of internal hydrocephalus was present, the ventricles containing air and a little turbid cerebrospinal fluid, their ependyma being coated with a thick glairy tenacious exudate, most marked in the right lateral and third ventricles. On removing this the ventricular wall showed mottled red foci of inflammation. There was no evidence of abscess formation. *Abdomen:*—The appendix scar was healthy. The liver, spleen, and kidneys were normal in size and appearance; the adrenals somewhat atrophic. The stomach and alimentary tract were normal.

Histology.—Spinal cord :—The grey and white matter appeared normal. The pia-arachnoid immediately surrounding the cord was infiltrated with polymorphs. The nerve roots were surrounded by a similar fibrino-cellular mesh-work. Deep-blue staining, circumscribed patches of concentrated polymorphs, and fibrin indicated cross-sections of elongated strands of fibrino-purulent material which had become inspissated in the larger interstices. Outside this zone the cellular reaction became more lymphocytic, and, further out, a very chronic arachnoiditis was represented by a thick layer of fairly dense, avascular, and relatively acellular fibrous tissue, intimately adherent to the inner aspect of the dura mater. This picture was that of a very chronic infection of the pia-arachnoid membrane, with a peripheral deposition of fibrous tissue. *Brain :*—The ventricles were lined by a thick layer of pus. The vessels just deep to the ependyma showed marked lymphocytic cuffing. The appearances indicated that infection at this level was more recent than in the cord.

This is a most instructive case because the necropsy findings prove what had been suspected on clinical grounds. The patient had had a very chronic, relatively mild inflammation of the subarachnoid space, which had resulted in fibrin deposition with subsequent organization. Some of this may perhaps have been due to the intrathecal sulphadiazine, but there is good clinical evidence that obstruction in the spinal subarachnoid space had begun some four or five weeks earlier. In this process of organization pools of infected C.S.F. had become shut off, and if the unorganized or even organized fibrin should break down then this infected C.S.F. would be liberated into the general subarachnoid circulation. It is possible, too, that these loculi may not develop the same concentration of any therapeutic substances as is present in the free-flowing C.S.F., so that even if the causal organism is sensitive to sulphonamides it is cleared only from the general C.S.F. circulation and not from these loculi. Any dilution of sulphonamide can be obtained, and endless possibilities of rendering a sensitive organism sulphonamide-fast arise. It is impossible to say how these loculi are liberated, but that this does occur can be seen from the relative rapidity with which a spinal block may disappear. This would seem to be a reasonable explanation for the relapses which form the most striking clinical feature of the condition.

Case III : Male aged 27

Herniotomy was performed on Jan. 26, 1942, in a general hospital under spinal percaine analgesia, 13 c.cm. being used. The patient developed clinical meningitis the next day and was treated with sulphapyridine. He improved and relapsed several times and was transferred to the neurosurgical unit on March 4. At first *Ps. pyocyanea* had been found in the C.S.F., but after arrival a short-chain non-haemolytic streptococcus, allied to *Str. faecalis*, and *B. coli* were found. The C.S.F. soon became sterile. Shortly after admission the meningitis increased in severity and he developed papilloedema followed by a right flaccid hemiplegia which became complete. He went on to develop a pseudo-bulbar palsy with increased jaw-jerk and an explosive dysarthria. He did not respond to sulphathiazole in large doses, and on March 23 it was certain that he was developing an obstructive hydrocephalus. He was almost moribund and certainly too ill to stand a posterior fossa decompression. He was started on sulphadiazine. From this time he began to improve and became less drowsy. The sulphadiazine was stopped after 100 g. had been given in seven days. He could now answer questions and respond to commands. The paralysis began to improve, and it became evident that he had a marked cerebellar ataxia on the right. He also had nystagmus on lateral gaze and a cerebellar dysarthria. He continued to improve physically, but as he did so it became obvious that he was badly hit mentally. He complained that he felt in a daze and that his brain worked very slowly. His memory and concentration were very poor, and he could not carry on a conversation for more than a few minutes because he seemed to fall into a dream state. By the time he left for the United Kingdom, at the beginning of June, he was able to walk alone and use his right arm for feeding himself and for writing. I heard from his wife at the end of November, and he had then been invalided from the Service. He was still hazy and unable to concentrate, and, compared with his state before this illness, seemed like a different man. His right arm and leg had almost recovered and he had had no relapse of the meningitis.

This case almost went the way of Case IV, and we were certain that the patient was beginning an obstructive hydrocephalus. It would appear that, whatever infecting organism was present, it was sensitive to sulphadiazine and that the formation of adhesions around the brain-stem did not continue to extend once this compound was given.

Whether the paralysis, which was pyramidal in type, and the cerebellar manifestations, which this paralysis masked, were due to brain-stem adhesions or whether they were due to a toxic vascular accident such as thrombophlebitis is uncertain. In addition to these local happenings there can be no doubt that the higher functions of the whole cerebral mechanism were impaired. The apathetic appearance, the continual complaint of being in a mental haze, and the marked inability to sustain any effort are remarkably reminiscent of the after-effects of a severe closed head injury. No formal intelligence tests were carried out in this case, but ordinary conversation was enough to suggest a falling off from the level indicated by his previous personal history. His wife describes an undoubted change of personality. These are certainly an indication of generalized hemisphere damage. It is unlikely that such damage could be due to the hydrocephalus alone, as this was of relatively short duration. It is more probably a direct result of cortical damage, though whether toxic or directly inflammatory, as has been suggested in meningococcal meningitis (Banks and McCartney, 1942), it is impossible to say.

Case IV : Male aged 24

On Dec. 27, 1941, this patient had a radical cure of a left inguinal hernia performed under spinal analgesia, 12.5 c.cm. of light percaine being used. The next day he developed meningitis. The C.S.F. and ampoules of percaine from the same batch were sterile. He appeared to respond to sulphapyridine, but, as with the other cases in this group, he relapsed frequently. By Jan. 30, 1942, he had developed papilloedema and was transferred to the neurosurgical unit. It was felt that he had an obstructive hydrocephalus, and the right lateral ventricle was tapped and methylene blue instilled. This failed to pass into the cisterna magna, thus demonstrating an internal hydrocephalus. He continued to have acute hydrocephalic attacks, which could be relieved by tapping the ventricles, but this relief was only temporary. On Feb. 20 a right subtemporal decompression was performed and, after this, lumbar puncture gave as much relief as ventricular puncture. This indicated that the hydrocephalus which was still present was no longer internal but external. As daily lumbar punctures did not help, a posterior fossa decompression was performed on March 9 by Major P. B. Ascroft, R.A.M.C. A fistula was made between the cisterna magna and the posterior cervical muscles, and the papilloedema slowly subsided. He improved very slowly. On June 17 an air encephalogram showed considerable dilatation of the ventricles. There was no obstruction at the fourth ventricle foramina, but there was obstruction round the brain-stem—no air passing on to the cortex.

In this case natural cure resulted. In the early stages the patient undoubtedly had a ventriculitis and a blocking of the outflow from the fourth ventricle. By the time this cleared he had developed an obstruction to the passage through the tentorium. He did not respond to any form of chemotherapy.

Case V : Male aged 25

On Dec. 23, 1941, appendicectomy was carried out under spinal analgesia, 12 c.cm. of nupercaine being used. Both the operation and the puncture were uneventful. The appendix was thickened and contained many concretions. Four days later he developed clinical signs of meningitis and was immediately lumbar-punctured. His C.S.F. was sterile at first, but later specimens grew an anaerobic *Staph. aureus*. He had several remissions and relapses, and was transferred to the neurosurgical unit on March 4, 1942. A control period without any form of therapy showed that a remission could occur spontaneously. He made no lasting response to sulphapyridine or sulphathiazole, but after a course of sulphadiazine he improved and no further remissions occurred. He was the only patient in whom no clinical evidence of spinal block occurred during the course of the illness. This lasted for 14 weeks, and a follow-up a year later showed that he had remained free from symptoms. It is impossible to say whether the cure in this case was due to sulphadiazine or to a spontaneous remission. In only one other patient (Case III) did cure follow so dramatically on a first administration of sulphadiazine. In the next three cases it obviously had no permanent effect whatsoever.

Case VI : Male aged 26

This patient had a radical cure of a right inguinal hernia after receiving 12 c.cm. of nupercaine. Two days later he developed clinical meningitis, which was confirmed by lumbar puncture. His fluid grew coliform bacilli and *Ps. pyocyanea*, but soon became sterile. In spite of this and continued chemotherapy with sulphadiazine he continued to relapse for three to four days at a time. During a prolonged remission his sedimentation rate (Westergren) was 39 mm. in one hour. He developed clinical spinal block about two months after the onset, and following this his relapses were characterized by severe pain in the back and a decrease of straight-leg raising with relatively little headache or neck stiffness. He improved slowly and did not relapse again after four months from the onset. His sedimentation rate was now 5 mm. in one hour, and his straight-leg raising 70° on each side.

Case VII : Male aged 19

On Sept. 3, 1942, this patient was operated upon for a low-grade pelvic peritonitis after receiving 13 c.cm. of light percaine. The appendix was involved, but it was thought unlikely that this was the cause. Three days later he developed clinical meningitis, confirmed by lumbar puncture, and a pneumococcus was grown from the fluid. The ampoules of percaine from the same batch as used in this case were sterile, but the local analgesic used for the skin grew *B. coli*. He appeared to respond to chemotherapy with sulphadiazine, but soon relapsed, and he continued relapsing and improving for five months before the infection fully cleared up. Like the preceding case, he developed spinal block about two months after the onset, and this disappeared slowly as the condition improved.

Case VIII : Male aged 29

In this patient the meningitis followed lumbar puncture. He is included because the course of the disease was precisely similar to that in the previous cases though no foreign substance had been injected into the subarachnoid space. In July, 1942, he had a pyrexial illness, in the course of which a lumbar puncture was performed. C.S.F. was perfectly normal. As his symptoms continued he was lumbar-punctured again, and on this occasion the puncture was reported as being difficult and a heavily blood-stained fluid was obtained. Six days after this second puncture he developed meningitis, which was confirmed by lumbar puncture. No organisms were grown. He was transferred to the neurosurgical unit and found not to respond to chemotherapy. He developed spinal block in five weeks, and lumbar punctures were given up. He did not improve, and five months later he was given calcium penicillin 2,000 units by lumbar tap. Unfortunately this was from the same infected batch as used in Case II, and there was a recrudescence of symptoms with a frank *Ps. pyocyanea* infection. This slowly cleared, and a month later he was almost cured. No further relapses occurred after this. The spinal block diminished as the condition improved. Until infected with *Ps. pyocyanea* in Jan., 1943, the case had differed in no essential feature from the previous three recorded. This case is of great importance, for it demonstrates that such a meningitis can occur without the deliberate injection of a foreign substance and cannot be due to chemical irritation alone.

These cases are similar enough to be considered as one group. The condition is a low-grade meningitis which, if it is not stamped out almost at once, causes the deposition of fibrin and the formation of adhesions, in the meshes of which infected C.S.F. may remain for a long time. Periodically this infected C.S.F. may be liberated into the general subarachnoid space and so cause a relapse. This illness is not as a rule immediately serious because the infecting organisms are rarely of high pathogenicity and, unlike the pyococcal infections, life is not at once threatened. So long as the condition is confined mainly to the spinal canal the arachnoiditis, whether it produces spinal obstruction or not, can cause no serious complications and, given time, will eventually resolve. When the infection spreads into the cranium, then adhesions may cause an obstruction to the flow of C.S.F. through either the fourth ventricular foramina or the tentorial hiatus. This results in hydrocephalus with its characteristic signs and symptoms. A ventriculitis may occur, but the general symptomatology and the post-mortem findings suggest that it is rare and if it occurs is late.

At some stage during the course of the illness the stiffness of the back becomes and remains more pronounced than the neck stiffness. This back rigidity usually continues for some time after the infection has died out and recovery is apparently well established. It is probable that the stiffness is due to spinal-root irritation. In the necropsy on Case II it was seen that the nerve roots were surrounded by a fibrino-polymorph cuff, and it is probable that until this undergoes resolution the irritation and consequent stiffness are maintained.

Aetiology

Three possible explanations have been advanced to account for the production of this form of meningitis.

1. The Chemical Theory

This theory suggests that the condition is entirely due to the irritant action of the spinal analgesic and that infection plays no part. This explanation is used by Livingstone, Wellman, Clark, and Lambros (1943) for two cases occurring in 4,006 nupercaine instillations. The clinical picture they describe is that of a mild meningitis occurring after special aseptic precautions which, on paper, seem almost fool-proof. The meningitis lasted four and five days respectively and then cleared up completely. No relapses occurred. The cellular outflow was almost entirely lymphocytic, with a rise in protein content in a sterile C.S.F. It is possible that these two cases may have been chemical in origin. There can be no doubt that the spinal analgesics are irritants and, like all irritants put into the theca, produce a protective reaction.

There have been several investigations into the changes in the C.S.F. following analgesia. Barker (1909) found that 24 hours after intrathecal stovaine there was an increase in leucocytes of various kinds. Iason, Lederer, and Steiner (1930), 12 hours after novocain spinal analgesia, found a pleocytosis, mainly lymphocytic, in 14 out of 31 cases. There was an increase of sugar but not of protein, and no correlation was observed between C.S.F. changes and post-spinal reactions. Konwaler (1943) investigated a series of patients one, two, and three weeks after spinal analgesia and found no changes of any kind. Experimental work has been done by Davis, Haven, Givens, and Emmett (1931). After the intrathecal injection of nupercaine in dogs, admittedly in larger doses weight for weight than are used in man, meningitic changes were present in the arachnoid. These consisted of a thickening of the membrane and collections of proliferated arachnoid cells and plasma cells in the interstices of the membrane. The exudates were mainly lymphocytic. If the animals were killed later, then organization and scarring was seen. This was most marked in the lumbar and sacral region and diminished steadily up the cord. There were some inflammatory changes in the ganglion cells and axis cylinders, but these were less definite and seemed less permanent.

There is therefore good evidence of the irritant effects of the spinal analgesics, but it would appear that with ordinary clinical dosage this irritation comes on at once, is short-lived, and settles down without relapse as the irritant is got rid of. A very good illustration of this occurred in Case I when sulphadiazine solution of too alkaline a reaction was put into the C.S.F. There was an immediate accentuation of meningitis, beginning in the lumbo-sacral region and travelling up the spine to the head accompanied by an increasing pyrexia. The reaction, though violent, lasted less than 24 hours, and there was certainly no tendency to relapse, as this was the beginning of complete recovery from the existing relapsing meningitis. Similar chemical "meningitis" has been seen after the use of impure or deteriorated iodized oils for opaque myelography. This clinical picture is quite different from that occurring in true infective meningitis.

The infrequency with which the infecting organism has been isolated is used to support the chemical theory, but, as has been shown by Smith and Smith (1941), it may have no significance. This is discussed more fully later. This theory cannot explain meningitis which follows simple lumbar puncture, as in Case VIII of this series and the similar cases quoted from the literature, for in these no irritants had been put into the theca. Yet the natural history of this meningitis is identical with that following the spinals. This would suggest that, whatever part the irritant may play, it is not the direct cause of the condition. It is also difficult to see why only one ampoule of a batch of percaine should be irritant.

2. Secondary Meningitis Theory

The next possibility is that the meningitis is secondary to infection elsewhere in the body. Weed, Wegeforth, Ayer, and Felton (1920) suggested on experimental grounds that lumbar puncture in the presence of bacteriaemia may produce meningitis, and their findings were confirmed by Remson (1936). This work is open to criticism because a heavy bacteriaemia was necessary before positive results were obtained. Pray (1941), from an

analysis of pneumococcal meningitis in children on whom lumbar puncture had been performed before the onset of the meningitis, was not able to confirm the experimental results.

In the present series, Cases I, III, IV, and VI were "clean" hernia operations, and there was no reason to suspect the prior existence of a bacteriaemia. In Case V a subacute mildly involved appendix was removed, in Case II an acute appendix was removed, and in Case VII a low-grade obscure peritonitis was found. In none of these patients was there a suggestion of bacteriaemia in the pre-operative phase. The clinical features of all the cases recorded were so similar as to suggest the same aetiology and pathogenesis in all. As secondary meningitis is not possible in the "clean" cases, one may argue that it is an unlikely explanation in the others.

3. Infective Theory

The third possibility is that the meningitis is due to the introduction of infected material along the lumbar puncture needle. It is true that in a number of cases it has not been possible to isolate the organism as might be expected in an infective condition. This may have a variety of explanations. In five of the cases described above the C.S.F. was sterile throughout the course of the disease if the known contamination with infected penicillin be excepted. In the three cases in which an organism was found it very soon became so attenuated that it could no longer be cultured. In spite of this the clinical state did not improve, thus indicating that the infection was still alive. If attenuation is the cause of the failure to isolate an organism then it may be that in the cases in which the C.S.F. was sterile from the first this attenuation was present early. Whatever the cause the only point that is made here is that failure to cultivate an organism is compatible with an infective origin. This is not infrequently seen in the meningitis which follows open wounds of the brain—an infective condition by all other standards. Smith and Smith (1941) have shown that special techniques are necessary to cultivate the organisms which may be found in this type of case, thus explaining some of the failures.

In the cases described by Barrie (1941) no causal organisms were found. The clinical picture and the necropsy findings, however, suggested an infective cause. Because of this negative bacteriology it was suggested that the condition was due to a virus, though the C.S.F. findings were unlike any meningitic reaction to known virus diseases. This carries the significance of the "sterile" C.S.F. too far. If an epidural abscess, osteomyelitis, or a subcutaneous abscess follows a lumbar puncture, it is regarded as infective whatever the bacteriology of the purulent material, and there is no logical reason why this should not be extended to the subarachnoid space.

The delay which usually occurs between the operation and the onset of meningitis is very suggestive of a phase of multiplication of an organism as a preliminary to the phase of clinical activity. The cases described all occurred in small groups—three in one hospital and two in each of two other hospitals. This may indicate that the conditions necessary for infection to take place were present in one institution for a short time and then were no longer found. Probably the most convincing evidence in favour of the infective theory is the cessation of fresh cases with the tightening up of aseptic technique.

4. Mode of Infection

From the evidence presented it is reasonable to conclude that these cases of meningitis are due to the introduction of organisms into the C.S.F. There can be little doubt that the spinal analgesics are mild irritants, and it is possible that the reaction to this irritation with the outpouring of protein-rich fluid gives reasonable conditions for an organism to gain a foothold. In no case has the spinal analgesic itself been infected. Bacteria have been found, however, in every other fluid used during the lumbar puncture. These include the local analgesic used for anaesthetizing the skin at the site of puncture, the spirit used for sterilizing needles and syringes, and the water used for rinsing these needles and syringes. There is no need to give here the details of the asepsis necessary for lumbar puncture and spinal analgesia, as every aspect has been fully considered in papers by Carnegie Dickson (1944), and Evans (1945), and in the *Lancet* (1944). That there is need for an absolutely rigid technique is shown by Smith and Smith (1941), who found bacterial contamination in 89 of 223 specimens of C.S.F. It is true that the contaminants were mainly non-pathogenic, but they suggest that these might be activated under suitable conditions. They thought that the contamination was mainly due to the "sterile" water used for rinsing needles and syringes, but it is possible that the sterilization of needles and syringes by means other than dry heat may be faulty.

Treatment

The only satisfactory treatment is prophylaxis. It should be possible to avoid these unhappy cases completely. If, owing to an emergency, a rigid technique is not possible, then spinal analgesics should not be used.

If the condition does occur it is essential to stamp out the infection as soon as possible, otherwise it may go on for months and even prove fatal. Unfortunately the causal organism is often not susceptible to present-day chemotherapy—i.e., sulphonamides and penicillin—but this should not prevent these substances being given an early and adequate trial. Once it has been established that they are ineffective, not only in preventing relapses but in clearing up each relapse, they should be discontinued. The commonest infecting organisms are probably *Ps. pyocyanea* and atypical *B. coli*. Botterell and Magner (1945) have suggested intravenous iodides for the former, whereas Ecker (1945) has found a combination of urea and sulphadiazine useful for the latter.

The formation of adhesions causing spinal block is common and calls for no special treatment, but if hydrocephalus occurs, then surgical relief may be necessary. In none of our cases was an attempt made to wash through the spinal subarachnoid space as suggested by Symonds (1925). In retrospect it appears that this may be a useful manœuvre if not put off for too long, as it might break up strands of fibrin and so wash away the foci of infection which cause relapses later on.

Apart from the specific attack on the meningitis all measures used in a long-continued septic illness must be tried, and of these whole-blood transfusion would appear most valuable.

Summary

Seven cases of meningitis following spinal analgesia and one following diagnostic lumbar puncture are described.

The condition is a low-grade meningitis caused by a variety of organisms introduced at the time of lumbar puncture.

The main clinical features are the chronic nature of the illness and the tendency to relapse.

It is suggested that this is due to the formation of adhesions containing infected C.S.F., which is liberated from time to time.

These adhesions may cause spinal block or hydrocephalus.

The cause of the condition is discussed, and on the evidence available it is decided that the likeliest cause is infection due to faulty aseptic technique. The irritation produced by the analgesic may enable an organism to gain a foothold.

Treatment is mainly prophylactic.

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TREATMENT OF BURNS: A PLEA FOR SIMPLICITY

BY

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"It can be said truthfully that the treatment of burns has returned to chaos."—Major-General P. H. Mitchiner.

It is sad to think that a distinguished surgeon and respected critic should be forced to the conclusion quoted as a text at the head of this paper. Modern war causes many burns, and during the past five years more surgeons have had to treat these cases than at any time before, and yet it must be agreed that about the treatment a good deal of confusion still exists. In part, at least, this confusion results from the large number of articles published and the numerous memoranda issued by separate authorities. Anyone who adds to this spate of literature takes upon himself a grave responsibility lest he confound yet more deeply the struggler in this therapeutic tangle. Yet General Mitchiner's challenge should be accepted.

My approach is purely clinical and personal. What follows is based on the results of treating regularly during the past five years patients with burns, under conditions that have varied very considerably. The numbers have not been vast, but the intake of patients has been very constant. Much has been learned from surgeons, physicians, pathologists, sisters, and orderlies. I do not intend to refer widely to the writings of others, believing that a picture drawn from the experience of one individual may be clearer than one which is composite.

Origin of the Chaos

The first step in trying to clear the confusion is to analyse some of its causes. A burn is a wound with infinite possible variations. It may extend widely or deeply, or both. Its effects vary according to the general condition of the patient—his age, his fatigue before being hurt, his associated injuries. Treatment depends on factors imposed by time and space: Was the patient burned in a factory, a tank, or a ship? Did his aircraft crash close to a well-equipped hospital or on a temporary landing-strip in the desert or jungle? The list of changeable factors in any single case of burns could be extended, but enough have been quoted to show that each patient must be considered individually. Yet surgeons hanker after a universal panacea. It is not uncommon to be asked, "How are you treating burns now?" That question is as intelligent as "How are you treating fractures now?" The questioner should not really be blamed for the folly of his remark, because from his student days onward he has been led to believe that there is "a" treatment for burns. Even the authors of the admirable Field Surgery Pocket Book published by the War Office in 1944 write that "there is *to date* no cure-all for burns," being reluctant to abandon the hope of some magic still to be found. Twenty years ago all burns were treated with carron oil or picric acid. Later, tanning was introduced, and this notable advance fell into disrepute because it was employed in all burns in all places under any circumstances. Unfortunately its defects were not critically analysed: its whole use was condemned, to be replaced by another panacea—the dyes. The saline bath, envelope irrigation, and plaster-of-Paris came next, and again were judged on their universal applicability, and by this uncritical test were found wanting. The same fate probably awaits penicillin.

The treatment of burns must in the present state of knowledge be to some extent empirical, because the pathological processes which make the patient ill or cause his death are as yet not fully understood. But by careful observation of those signs and symptoms which are comprehensible a high standard of treatment can be achieved, function can be preserved, and lives saved. Such a study can perhaps be more easily made in the Royal Air Force. The admissions for burns are steady and regular, and there is only very rarely the urgent pressure of a large number of battle casualties. Furthermore, the nature of the trauma and the extent of the burns which follow an aircraft crash are remarkably constant, so that successive cases are comparable. The extent of such burns depends on the protection of clothes, and from the same trauma a man is more seriously injured if wearing a sleeveless shirt and shorts instead of full flying clothing. A study of these two groups of cases—those at home and those over-seas—has been clinically instructive. From that study has emerged a plan of treatment which, with variations, can be made applicable to any case of burns; but at each stage of treatment the surgeon must examine his patient, and the details depend on the circumstances of the time and his own experience. There is no single all-embracing universally applicable treatment for burns, and never will be. The surgeon who attains that belief is a long way towards reducing chaos to order.

Degrees of Burns

From the clinician's point of view burns are of two degrees—slight and severe. Slight burns are those in which there is no detectable general disturbance; severe burns are those in which the general treatment of the patient is more urgent than the local treatment of the burn. The differential diagnosis is not always so easy as it sounds, because fit young men widely burned show for a few hours an astonishing vitality. One such walked four miles to get help for his injured companions. This temporary well-being leads at times to disaster, for it is followed by a quite sudden collapse. Patients apparently not very ill have been sent by ambulance car or aircraft on journeys they were not fit to make, and have arrived at hospital moribund. If there is any question in the medical officer's mind as to whether the case is one of severe or slight burns the patient must have the benefit of the doubt. No patient has died because his doctor took an over-cautious view of his burns and refrained from rushing him off to a special centre; a number have died because they were thought to be fitter than they in truth were.

Any other classification, or attempt at classification, in the early stages is useless, and (what is worse) confusing.

Slight Burns: Local Treatment

There are three types of local dressings available: (1) wet dressings, changed at intervals, of saline or antiseptic; (2) occlusive dressings, of tannic acid or dyes; (3) greasy dressings. A wet dressing is suitable for a fresh burn not cleaned or an old one gone septic. An occlusive dressing is successful if the wound is clean and the burned area one that is relatively immobile. It is therefore not good as a first-aid dressing, nor on the fingers, face, and flexures. Greasy dressings are very comfortable and proper on the face and fingers, but should not be used too continuously; the raw surface gets grease-logged and indolent. It is admirable as the skin heals. All three have their place in the local treatment of burns if the surgeon knows why he has chosen one of the three for the particular problem he is trying to solve.

Since the appearance of considerable numbers of cases of sulphonamide skin sensitivity, the use of any sulphonamide powder locally is to be viewed with some caution. For first-aid treatment wet saline dressings give reasonable comfort and do not prejudice later treatment; "Glasgow cream," if available, is probably best of all. Penicillin is still experimental. It seems so far to have a place but not a monopoly in the local treatment of burns.

Severe Burns: General and Local Treatment

In every case of severe burns there are a series of symptoms and signs which must be looked for, and, if found, treated. The details of treatment vary, but the particular points should be checked over in each patient.

1. Any case assessed as severe first requires intravenous plasma. It is extremely valuable to have the haemoglobin estimated before treatment is started, and essential to have this done as soon as possible: from beginning to end, the chart of the haemoglobin percentage is as important as that of the temperature and pulse. Follow the plasma by intravenous glucose-saline until it is apparent that the patient can drink enough, without vomiting, to prevent dehydration. A fluid-intake-and-output chart gives the surgeon complete information on this point, and treatment varies accordingly. There obviously cannot be a statutory number of bottles or days during which the drip should be maintained.

2. Local Treatment.—Despite the early appearance of organisms in a burned area there is no desperate rush to get at the wound. Under morphine alone, the burned areas are cleaned with all aseptic rites, blisters snipped, and very carefully dressed with tulle gras or

vaselined gauze or Glasgow cream. If possible, these dressings are to stay on several days; the most likely reason for having to shift them is that they become uncomfortable. Hence the need for care in applying them. Guard the ends of the fingers by a Cramer wire splint which projects beyond the tips. Give morphine for pain. The procedure is slow: to be done properly it must be done carefully. Under the urgent pressure of battle it may be very difficult to do properly, but that is no real criticism of the method. There are surgical operations which cannot be skimped or done roughly without the work becoming second-rate: the first dressing of a burn is one of them.

3. It is, as already stated, the purpose to leave the dressings alone for four days at least. In the interval the patient needs fluids, glucose, and rest. If his burns are reasonably comfortable he will sleep better with a hypnotic than with morphine. So many doctors seem to have no thought beyond morphine, though the man is suffering not so much from pain as from sleeplessness and nightmares.

4. After three to seven days, depending on the general condition, it is time to think of doing the first dressing. The limbs are beginning to get uncomfortable; the patient is rested; his fluid intake, by whatever route, stable. For an extensively burned patient there is nothing which makes him so comfortable, or the dressing so easy, as a bath. Elaborate machinery, though desirable, is not essential. An ordinary bath, cleaned with cresol, filled with warm water to which salt has been added to give rough normal salinity, does very well. On one occasion a bath filled with buckets of water boiled on primus stoves met an urgent need in treating two badly burned airmen. In the early stages, during the separation of sloughs, a daily bath seems best. Later, when the wound reaches the healing stage, it may make the granulations soggy. Judge the need for baths by the state of the wounds and the comfort of the patient. If the hands are burned, keep the fingers moving in the bath. For limited burns, especially of the hands, the envelope irrigation treatment is successful. With adequate organization, baths are as easy to arrange: with a large number of cases to be treated and a small staff, envelope irrigation may be a satisfactory alternative. But I feel bound to point out that some form of bath treatment centre can be improvised in any hospital if it is thought important enough: in R.A.F. hospitals in one command abroad a bath department was planned in each improvised building as automatically as was the operating theatre.

5. Food, with extra proteins, is the next care. In practical terms this meant abroad plenty of eggs. Patients with badly burned faces are apt to go short, but an adequate diet is very important. As important is attention to the bowels: these patients get constipated, and are much more comfortable and eat better when their bowels start to move.

6. Check the haemoglobin at any time that the patient's condition causes anxiety or if progress is slow, and always on the tenth day. If it is below 80%, check daily, and if thereafter it falls two days running, give a pint of blood. Give more if this does not check the fall, but one transfusion sometimes starts the curve upwards.

7. As the patient's general condition improves, the question of first-aid grafting where skin has been destroyed becomes urgent. The aim of the general surgeon is to preserve function and give the plastic surgeon as good a foundation to work on as possible. Ogilvie's definition of the need at this stage for "more optimism than sense" is the guide. It is often practicable to get skin to "take" on a raw area on the back of the hand that is continuous with discharging areas over infected phalanges. It is beyond the scope of this paper to discuss details of grafting, but it is important to know when to start this procedure. The answer is—at the very first sign of spontaneous healing at the edge of the raw areas. Whatever the bacteriology of the wound may be, natural healing shows that conditions are favourable for trying to graft. If the first attempt fails, try again. Thiersch, "postage stamp," and pinch grafts all have their place.

Summary of Important Points

It has already been explained that there can be no universal treatment for burns, but the purpose of this contribution is to try to show that there are certain recurring clinical pegs on which to hang the details of treatment.

1. Decide whether the burn is slight or severe. If in doubt, treat as severe and give general treatment first.
2. Local treatment depends on the nature of the wound and a consideration of outside factors such as nursing and transport.
3. Prevent dehydration by checking fluid intake and output. Ensure sleep.
4. Baths.
5. Watch the diet. Keep the bowels open.
6. Watch the haemoglobin and keep the record on a chart.
7. Graft at the first prospect of success.

By going over these points when faced with a case an intelligent approach to treatment is achieved. It used to be so common to find the surgeon wondering what to "put on" a dirty-looking burn ten days old when the patient had been constipated for a week and had a haemoglobin of 50%. Whether or not sulphonamides, penicillin, or anything else should be used can all be decided by observation of the individual patient, his wounds, and his charts. They cannot be given by rule of thumb.

Shock and Toxaemia

These two words appear in any paper or discussion on burns, and this one is no exception. They are, however, introduced for a special reason. Until they receive a much more definite meaning the surgeon treating burns would do well to forget them. That is not to deny that they are pathological factors, and it is to be hoped and expected that pathological and biochemical research will endow them with meaning which will aid the clinician in specific therapy. Until that day arrives the surgeon should break down his patients' symptoms and signs into words which have a practical application—pain, sleeplessness, dehydration, anaemia, and so forth. He will find it more profitable than sheltering behind "shock" and "toxaemia," which delude him into thinking he has made a diagnosis, and leave him stranded as to what to do to help. In certain severe cases he will find that there remains, when all possible lines of treatment have been used, some unknown factor which is keeping the patient ill and preventing progress, and for convenience that something unknown can be called "toxaemia." It is, however, for the clinician a dangerously seductive word, and there is a good case for using it very cautiously and a better one for not using it at all.

Comment

The infinite variety of problems presented for solution in the treatment of burns means inevitably that a volume of great size would be required to cover all the points that can arise. The omissions in this paper are deliberate. The points stressed are of universal application, and on them can be based the details which must be considered in every case. One omission demands a note—namely, the value of blood-pressure estimations. In so many of my patients has it been impossible from the nature of the burned areas to obtain readings that I have ceased to rely on them, depending on other signs for guidance; but if the blood pressure can be measured it helps.

On one point of detail a personal view is submitted. Severely burned patients travel badly until their general condition is stabilized, which usually takes from four to ten days. Long journeys for injured patients form a tragic feature of surgery in an oversea command. Burned patients do better if their general condition is treated well and they are kept quiet and still even under quite rough conditions, with poor facilities for local treatment, than if they are hurried away to the most lavishly equipped special centre. Paradoxically, some of the most severely burned men have lived because the medical officer forward has had no doubt in his mind that a journey would be fatal, and has kept and treated his patient, while others less badly injured have been sent on their way and have died. Hence the urgency of the need for teaching that in any case of doubt general treatment must have priority, and for eradicating the belief that there is some local dressing, be it ointment, powder, dye, or lotion, which can by its wonderful property save the patient's life.

Conclusions

In our knowledge of the treatment of burns there are gaps. They will be filled by the researches of pathologists, biochemists, and others; and with the information they provide the surgeon will be able to approach his patients with more confidence than he now has. My failure to refer to the amount of work done on this subject implies no disparagement, but its very mass is to the clinician somewhat confusing. It is my contention that the surgeon who tackles a case of burns as he would any other traumatic problem, with an analysis of symptoms and signs, will find his anxieties enormously reduced, his path clear, and in his mind tidiness instead of confusion. He will find himself varying his detailed technique from case to case as in any other branch of surgery. As research develops new information he can try new lines, for with their variety burns

keep on presenting new difficulties for solution. But withal he must avoid the confusion of detail and not be ashamed to rely on the simple practice of good surgery.

I am very grateful to many medical officers serving on units and in hospitals and in administrative posts, to nursing sisters, and to orderlies. They have shown that the handicaps imposed by an over-sea campaign, the necessary improvisations, and long distances are no real bar to a high standard of burns treatment when faced with intelligent enthusiasm and understanding. For such views as are not in accordance with the current teaching on burns, or appear unduly dogmatic or provocative, I am solely responsible.

FIRST-AID TREATMENT OF PHOSPHORUS BURNS

BY

W. McCARTAN, M.D., M.R.C.P.

AND

E. FECITT, M.P.S.

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The facility with which copper combines with active phosphorus to form copper phosphide has been the basis of most methods of first-aid treatment of persons contaminated with phosphorus. The standard treatment suggests that the burning phosphorus should be extinguished with water, keeping the burned area damp and removing the patient to hospital for surgical attention as quickly as possible. The burn is treated with aqueous solutions of sodium bicarbonate and copper sulphate.

The principal objections to this treatment are that such solutions are cumbersome to carry and are not likely to be immediately available in civil defence and active service conditions, although speedy application is, of course, all-important. Also, the number of persons contaminated may be so large that immediate active surgical attention to all is not possible, and in the meantime it is necessary to repeat the application of the solution—not the best treatment for an already shocked patient. There is, further, the danger that repeated applications of fluid may wash particles of phosphorus to the periphery, with the risk of peripheral burns.

The possibility of damage to this institution by phosphorus-containing incendiaries during air attacks and the prospect of having to deal with a number of casualties among our population led us to investigate this matter with a view to producing a substance which fulfilled the following requirements: (*a*) it should be readily available in a compact form; (*b*) all the remedies should be contained in one compound; (*c*) it should immediately extinguish the phosphorus and inactivate the products of phosphorus combustion—i.e., phosphorus pentoxide and phosphoric acids; (*d*) it should be viscous and stick to the skin so as to remain in position, and also hold the particles of phosphorus *in situ*; and (*e*) it should be easily removed by warm water.

Godding and Notton (1942) suggested the use of copper sulphate, glycerin, and starch. Tomski (1943) recommended for trial two creams, the first containing 20% of sodium bicarbonate, and the second copper both as oleate and as sulphate. Tomski suggested that the two creams could be carried by fire guards, wardens, etc. Goldblatt and Oakeshott (1943) considered that aqueous solutions of copper sulphate would be unlikely to interact with solid phosphorus or with phosphorus dissolved in some solvent not miscible with water to produce total inactivation of the phosphorus. They suggested the use of copper oleate, with which they combined a rubber solvent.

One of us suggested the use of sapo mollis *B.P. Add. III* as the base for incorporating copper sulphate, and after many trials a compound was prepared with a final content of 4% copper salts. The damage to tissue by burning phosphorus is thought to be due not only to the heat of combustion and to the corrosive action of phosphoric acids formed as the terminal result of such combustion but also to the intensely hygroscopic action of phosphorus pentoxide, which is the intermediate stage of the change. Phosphorus pentoxide "mops up" water with great avidity and with the production of intense heat, and we suggest that, applied to the skin, a film of water sufficient to extinguish the phosphorus flame will not be adequate to provide the pentoxide with enough water to supply its needs; thus tissue fluid is called on, causing further damage. For this reason a high proportion of water was mixed with the compound. It was also felt that water loosely held in depth over the area by such a compound might act as a better conductor of heat than air and that in this way the heat generated by the change—$P_2O_5 + 3H_2O \rightarrow 2H_3PO_4$—would be more easily removed from the site of the injury. The method of production of the copper-soap compound is described later.

Bench and personal trials showed that the compound was extremely quick in action. Burning phosphorus was extinguished immediately and phosphide formation was very rapid. It also appeared to us that the inactivating layer of copper phosphide on the surface of a piece of phosphorus was of greater depth than with the copper sulphate solution. The black phosphide particles were very clearly visible in the green mass of the compound, giving an excellent colour contrast, and this may be important where manual removal in the operating theatre afterwards is necessary. The compound is adhesive and remains *in situ*, but is easily washed away with warm water.

Through the co-operation of the Ministries concerned, arrangements were made for tests to be carried out on experimental burns, and we are deeply indebted to Prof. G. R. Cameron and Mr. F. Burgess for their reports and for permission to publish them.

REPORT I

Treatment of Experimental Phosphorus Burns with Copper Sulphate Soap (Prof. G. R. Cameron and F. Burgess)

Adult rabbits (2 kg. body weight) were given standard phosphorus burns on the shaved skin of their backs. Under nembutal anaesthesia, 0.1 c.cm. of a 50% solution of yellow phosphorus in carbon bisulphide was applied to an area of skin enclosed by a metal ring 19 mm. in diameter, ignited, and allowed to burn for 15 seconds. Such burns are remarkably similar in depth and reaction, and heal in about 5 to 6 weeks when treated simply by water application. Two such burns were made on each rabbit—one being treated at once by repeated application of the copper sulphate ointment, which was renewed until it failed to turn brown or black, the other burn serving as a control and treated in some instances with water alone, some with the standard sodium bicarbonate-copper sulphate solution method (*Medical Manual of Chemical Warfare*, 1943, p. 50). In a third group the copper sulphate ointment was compared with copper sulphate ointment followed after two hours by 2% solution of sodium bicarbonate. In all instances the ointment was allowed to remain on the burn for several days. Comparison of healing times, judged by separation of the scabs which invariably form on the burnt surface, was adopted as the measure of effectiveness of treatment. Results are shown in Table I. It is apparent that the ointment-treated phosphorus burns heal more rapidly than burns treated with water or with the standard sodium bicarbonate–copper sulphate solutions. In the latter case there was as much as a fortnight's difference in healing times; in the former, nine days. These results are statistically significant.

With the third group of experiments, in which application of copper sulphate ointment was contrasted with ointment application followed after two hours by removal of ointment with sodium bicarbonate solution, the procedure was changed. All animals were killed on the 28th day, when healing was nearing completion, and the burns examined microscopically. The notes in Table I bring the main findings into contrast. There is no doubt that the follow-up of copper sulphate ointment application by washing with 2% sodium bicarbonate solution has aided healing; the bicarbonate solution is also excellent in removing the ointment if cleaning up of the burnt area is desired.

One striking effect of the ointment is the marked tissue reaction seen during the first 24 hours around phosphorus burns so treated. We examined microscopically the burns of five rabbits at this stage and found a great deal more oedema and cell infiltration than in burns treated by other methods. It is possible that an excessive reaction might have its disadvantages; it might lead, for instance, to more pain if the oedema were

confined under tension, or it might predispose to secondary infection. But it has not led to interference with healing; on the contrary, the ointment-treated burns have healed more rapidly than those with other treatments, accompanied though they are with less initial reaction. Perhaps the ointment has evoked a useful counter-irritation effect; but this is purely conjecture.

TABLE I.—*Healing of Phosphorus Burns with Various Treatments*

Rabbit	Healing Times in Days	
	Copper Sulphate Ointment Treatment	Water Treatment
810	22	19
811	20	20
812	19	20
813	20	20
1594	26	55
1595	27	56
1596	34	42
1597	26	40
1628	27	31
Mean ..	24·6	33·7
	Copper Sulphate Ointment Treatment	2% Sodium Bicarbonate + 1% CuSO Treatment
1654	31	31
1655	24	45
1656	24	45
1657	33	47
1658	31	45
Mean ..	28·6	42·6
	Copper Sulphate Ointment Treatment	Copper Sulphate Ointment followed after 2 Hours by 2% Sod. Bic.
	Microscopical Findings 28 Days After Burning	
1837	Very large epidermal defect, large scab, little dermis reaction	Moderate epidermal defect, small scab, little dermis reaction
1838	Large epidermal defect, large scab, little reaction	Completely healed over
1839	Almost complete healing, very little dermis reaction	Complete healing, but epidermis thin, little reaction
1840	Moderate epidermal defect with scabbing, little dermis reaction	Healing nearly complete
1841	Scab attached to two small epidermal gaps, little dermis reaction	Scab attached to one small epidermal gap, little dermis reaction

We conclude from these experiments that copper sulphate ointment, in addition to being an excellent first-aid measure for phosphorus burns, is of value in the healing stages also, since it has reduced the healing time of burns in striking fashion. We would suggest that it be combined, in subsequent treatment, with sodium bicarbonate solution; for the latter allows of the easy removal of the ointment if the burn is to be inspected, assists in the disposal of any phosphorus which may still persist after ointment treatment, and tends to reduce the healing time of the burns.

Trials of preparations of this type involving emergency methods are extremely difficult to arrange. We are, however, informed by Surg. Capt. Fairley that at the time of the trials of the compound a scientist sustained a badly mangled hand due to a phosphorus grenade exploding in his hand. There was very serious tissue laceration of one hand and the loss of several phalanges of both hands. Burning phosphorus was embedded in the lacerated tissues of one hand. The compound gave excellent results, and after the patient's removal to hospital for urgent surgical treatment the soapy character of the first-aid application allowed his various injuries to be quickly cleaned up before operative treatment was undertaken. The surgeons made favourable comment on this.

The compound was issued in this hospital in wide-neck glass jars each holding half a pound. The mouths of the jars are 3 in. in diameter, thus enabling the operator to insert his fingers and obtain a sufficient quantity at once.

A sample of a German paste preparation suggested by H. Stadlinger (1944) was prepared and forwarded for examination. A comparison of this German paste and the copper–soap compound was made, and was reported on as follows.

REPORT II

Treatment of Experimental Phosphorus Burns with a German Paste (Prof. G. R. Cameron and F. Burgess)

This paste (Stadlinger, 1944) contains $CuSO_4$ 2 parts, bolus alba (i.e., kaolin) 70 parts, and water 100 parts. The following tests were carried out in order to compare Stadlinger's paste with the $CuSO_4$ ointment of McCartan and Fecitt as well as with water treatment. Groups of 10 rabbits were used. Under nembutal anaesthesia 0.1 c.cm. of a 50% solution of yellow phosphorus in carbon bisulphide was applied to an area of rabbits' skin enclosed by a metal ring 19 mm. in diameter, ignited, and allowed to burn for 15 seconds. Two such burns were made on each rabbit, one being treated at once by repeated application of the British $CuSO_4$ ointment, the other being treated with Stadlinger's paste, applied repeatedly until discoloration of it ceased. In another series of rabbits the Stadlinger paste method was compared with water treatment. Comparison of healing times, judged by separation of scabs which form on the burnt surface, was adopted as a measure of effectiveness of treatment. Results are shown in Table II. In addition, microscopical comparison of burns variously treated, and examined after 24 hours, was carried out to determine initial reactions to the treatment.

TABLE II.—*Healing of Phosphorus Burns After Various Treatments*

Rabbit	Healing Times in Days	
	British Copper Sulphate Ointment Treatment	Stadlinger Paste
4231	23	32
4232	23	32
4233	23	42
4234	32	45
4235	35	45
4241	23	37
4242	23	37
4243	24	37
4244	24	38
4245	28	38
Mean ..	25·8	38·3
	Water Treatment	Stadlinger Paste
4226	42	27
4227	34	27
4228	37	42
4229	38	45
4230	50	45
4236	50	34
4237	42	37
4238	44	37
4239	44	37
4240	44	41
Mean ..	42·5	37·2

The mean healing time for burns treated with the British $CuSO_4$ ointment was 25.8 days, for the Stadlinger paste 38.3 days. The difference is significant. In the second group of rabbits the mean healing time for burns treated with water alone was 42.5 days, for the Stadlinger paste 37.2 days. This difference is barely significant. The cheering result of the investigation seems to be that the British $CuSO_4$ ointment is much better than the Stadlinger paste in promoting healing, while the latter has little advantage over water treatment. Microscopical examination of burns 24 hours after treatment showed somewhat more inflammation with the Stadlinger paste than with the British $CuSO_4$ ointment. The $CuSO_4$ ointment is very much easier to apply and remove than the Stadlinger paste. Secondary infection was not seen in any of these experiments.

We conclude that the British $CuSO_4$ ointment is much superior to the German paste.

Preparation

For convenience in handling the compound was made in ½-lb. lots. A 25% solution of copper sulphate in water was prepared and the requisite amount of this to give a final content of 4% copper salt was heated in a boiling-flask. Sapo mollis was heated in a water bath, and the copper sulphate solution was added hot by constant trituration on a slab. Copper precipitates as oleate, and this is thoroughly incorporated into the base between each addition. It is advisable to add the copper

sulphate solution in small successive portions. The resulting compound is a tacky homogeneous mass, and samples have kept very well for at least twelve months. The *p*H of the final compound, determined electrically, is 8.65 at 19° C. and 8.24 at body temperature.

Sapo mollis *B.P. Add. III* is described as the sodium or potassium soap of a suitable vegetable oil or oils or the fatty acids therefrom, other than coconut oil, palm-kernel oil, or their fatty acids. The sapo mollis used in the above preparation was supplied by British Drug Houses Ltd., and has proved very consistent and suitable for the purpose.

British Drug Houses Ltd. sent us an analysis of the sapo mollis as follows: 51.7% of fatty acids, as compared with the *B.P.* recommendation of not less than 44%. The fatty acids have a solidifying point of 17° C. (*B.P.* not higher than 31° C.), an acid value of 191.5 (*B.P.* not greater than 205), and an iodine value of 146.5 (*B.P.* not less than 83). Resin acids are absent. The soap contains no free alkali hydroxide and no free fatty acids. The total free alkali, calculated as Na_2CO_3 in 10 grammes, is equivalent to 0.2 c.cm. N/1 sulphuric acid, as against the *B.P.* limit of 1 c.cm. N/1 acid.

Conclusions

The copper–soap compound is an effective first-aid treatment of phosphorus burns.

Being a viscous and compact substance, it can be carried about easily by nurses, fire guards, etc.

In experiments, using the copper–soap compound, the healing time of wounds was substantially reduced as compared with the standard treatment.

We express our thanks to Prof. Sir Francis Fraser, Director-General of the Emergency Medical Services, and to Mr. J. B. Hunter, F.R.C.S., Sector Hospital Officer, for their great interest and help. We gratefully acknowledge the work of Prof. G. R. Cameron, Mr. F. Burgess, and Lieut.-Col. Collumbine, who carried out experiments; and also the arrangements made by Surg. Capt. A. Fairley. We are much indebted to the Medical Research Council for the help given us through Dr. F. H. K. Green and members of the Burns Subcommittee. We also wish to record our appreciation of the helpful advice and criticism given by Mr. R. F. Nunn, B.Sc., biochemist to this hospital.

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GLOBIN INSULIN: CLINICAL TRIAL

BY

J. M. MALINS, M.B., M.R.C.P.

In the present trial globin insulin (G.I) has been used in single daily doses in 36 cases, of which 33 had had no previous treatment. All the patients gave a history of acute onset of diabetes with thirst and wasting. The diet was approximately the same for all; it contained 180 g. of free carbohydrate with an average proportion of protein and fat, and allowed patients to use the normal resources of the home kitchen or works canteen. The carbohydrate was spaced as follows: breakfast, 50 g.; dinner, 50 g.; tea, 30 g.; supper, 50 g. The range of insulin dosage was 10 to 40 units, with an average of 24, the injection being given half an hour before breakfast.

Results.—(*a*) In 10 cases perfect control, both clinical and biochemical, was obtained. The health remained normal, the blood sugar did not rise above 180 mg. per 100 c.cm., and the urine contained not more than a trace of sugar. The average dose of G.I. in this group was 20 units. It is notable that seven of these ten patients were regarded as exceptionally co-operative. (*b*) In 16 cases control was only fair. Hyperglycaemia and glycosuria persisted, although the weight and general health were on the whole maintained. The main difficulty in this group was the frequent occurrence of insulin reactions, even when the dose of insulin was increased only to control the symptoms while hyperglycaemia persisted. Six of these cases have been changed to a P.Z.I.-S.I. mixture with satisfactory results. (*c*) In 10 cases the control was certainly inadequate and diabetic symptoms persisted—e.g., pruritus, weakness, or occasional thirst. Five of these have been changed to a P.Z.I.-S.I. mixture, and the others will almost certainly be treated likewise in the near future.

Hypoglycaemia.—Eighteen patients complained of insulin reactions, the symptoms in general being those common with S.I.—sweating, trembling, weakness, and hunger, relieved at once by food. In 12 cases the symptoms occurred between 11 a.m. and noon (four to five hours after the injection). In three cases the symptoms began at 6 p.m. and headache and weakness were outstanding, while relief from food was not immediate—features which resemble the P.Z.I reaction. In one case the incidence was at 4 p.m., in the other at 8 p.m., and one man stated that he felt identical symptoms twice in one day—at 11.30 a.m. and 6 p.m.—which must be a rare event with any type of insulin. Local reactions occurred in two cases only, and were transient.

Blood-sugar Readings.—In 11 in-patients the blood sugar was studied throughout 24 hours at approximately two-hourly intervals. The diet was that described above and the average dose of G.I. was 24 units. The results were inconstant, but three average curves are shown (Figs. 1–3) which suggest that

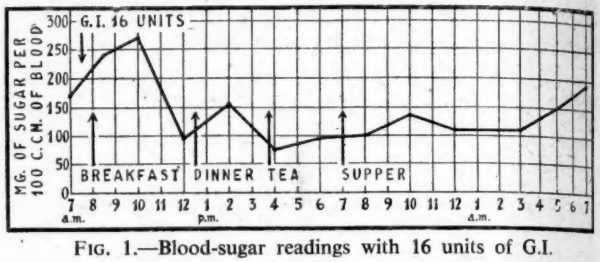

FIG. 1.—Blood-sugar readings with 16 units of G.I.

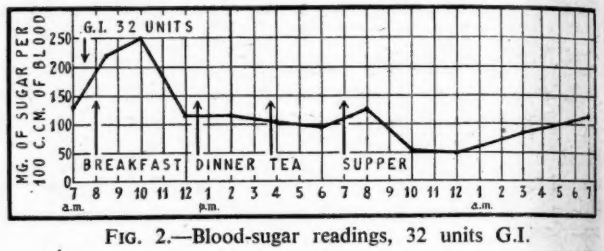

FIG. 2.—Blood-sugar readings, 32 units G.I.

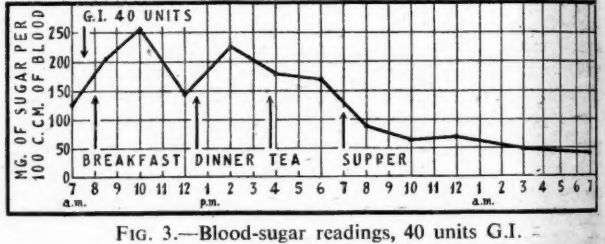

FIG. 3.—Blood-sugar readings, 40 units G.I.

with increase of dosage of G.I. the insulin activity is delayed in onset and prolonged. (1) With 16 units hyperglycaemia occurred after breakfast, but not after the midday or evening meals, while the fasting blood sugar was well above normal the next morning. In this particular case good health was maintained for six months on this regime. (2) With 32 units there was still hyperglycaemia after breakfast, but later in the day (15 hours after the injection) the blood sugar fell to dangerous levels, while the fasting sugar next morning was not grossly raised. (3) With 40 units hyperglycaemia occurred after breakfast and the midday meal, the insulin action being delayed, with very low figures throughout the early hours of the following morning (lowest figure 24 hours after injection).

Discussion

The action of G.I. has been compared with that of other insulins under experimental conditions by Bauman (1939) and Duncan and Barnes (1941), and in both papers was found to be intermediate between P.Z.I. and S.I., with maximum hypoglycaemic effect eight hours after the injection. In clinical use it has been commended by Bauman (1939, 1940) and Andrews and Groat (1940), who were able to control mild and moderately

severe cases with a single dose. Relatively high carbohydrate diets were used (250 g.) and some extraordinarily high doses of G.I. are quoted; one case received 200 units of G.I. in a single dose (Bauman).

The present investigation is concerned only with the place, if any, of G.I. in the treatment of diabetic patients. To have any value it must be shown to have advantages over either S.I. or P.Z.I. in single daily doses. Lawrence (1943) suggests that G.I. is not significantly different from P.Z.I., but results in the present series do not agree with this conclusion. G.I. has been found to be more active than P.Z.I., often with embarrassing results, as the frequency of insulin reactions has been the greatest difficulty in reaching an adequate single daily dose.

With the dietetic regime used in this clinic globin insulin has a limited place in treatment. It is suitable for mild or moderately severe cases requiring less than 30 units daily, and only for those who are regular in their dietetic habits. The absence of local reactions may be an indication for its use instead of P.Z.I.

Summary

The results of treatment with G.I. in 36 diabetic patients are described. The greatest drawback to its use has been the frequency of hypoglycaemia. G.I. is considered to have a limited place in the treatment of mild and moderately severe diabetes.

I would like to thank Dr. A. P. Thomson and Dr. G. H. Knight, under whose care these patients were treated.

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A CASE OF PARAPLEGIA AFTER CEREBROSPINAL MENINGITIS

BY

H. HILTON STEWART, M.D., M.R.C.P.

Paraplegia is one of the many nervous complications of cerebrospinal meningitis, and may be organic or functional (Rolleston, 1919). Most cases occur during the course of the acute phase of the disease and gradually tend towards recovery, although permanent paraplegia is recorded. The pathology may be pressure on the cord due to exudate, haemorrhagic or purulent, and not matting of adhesions or a diffuse meningomyelitis (de Massary and Chatelin, 1910). Lesions localized both to the brain and to the spinal cord have been described (Ribadeau-Dumas *et al.*, 1938).

Onset of paraplegia after the acute phase of the disease has passed off does not seem to have been recorded, but a case of syringomyelia occurring four months after cerebrospinal meningitis has been observed (Guillain *et al.*, 1939). The case here reported is therefore unique in that it occurred one year after the acute phase of the meningitis, and was due to organized adhesive meningitis causing diminution of the blood supply to the mid-dorsal area. Division of these adhesions presumably restored the blood supply, and function very slowly recovered. It must be excessively rare for any spinal compression case to make complete recovery after an interval of 1½ years from the removal of the obstruction, but such is the fact in this case, and the only departure from normal demonstrable in this patient now is a scar on her back.

Clinical History

A child about 12 years old was admitted to Lurgan and Portadown District Hospital isolation ward on March 29, 1940, suffering from acute meningitis. While no meningococci were cultivated, the C.S.F. was slightly turbid and contained pus cells, and was thought to be definitely meningococcal. She was treated with a full course of sulphapyridine orally and antimeningococcal serum intravenously. Her affection ran a subacute course and she was in hospital 5½ weeks, being discharged cured on May 14, 1940.

In March, 1941, the patient began to have difficulty in walking. She first noticed that her right foot was trailing and catching the ground so as to trip her. The weakness gradually increased in both legs. The only other symptom was difficulty in starting micturition. She was admitted to Lurgan and Portadown District Hospital on May 7, 1941, paralysed in both legs. On examination she was well nourished and in good general condition.

The fundi were normal, and above the waist she was normal in every respect. There was a spastic paresis of both legs, without local wasting. The right leg was more affected than the left. She was unable to sit up from the lying position without assistance. Sensation to light touch was preserved in both legs anteriorly and posteriorly. Appreciation of pain and temperature was lost below the middle of the thigh on both sides. Appreciation of vibration sense was lost below the knees. Muscle and joint sense seemed normal. The abdominal reflexes were absent. The right knee-jerk was brisker than the left. Ankle-jerks were present. Ankle clonus was present on the right side and plantars were bilaterally extensor. The C.S.F. was examined on May 8, 1941, when only a few drops of clear fluid came out under jugular compression. The test was repeated three days later, when, with difficulty, a larger specimen was obtained. It contained 250 mg. of protein per 100 c.cm., a trace of globulin, 700 mg. of chloride per 100 c.cm., 0.025% sugar, and no pus cells. The culture showed a few contaminants.

The sensation now altered, and for a time the patient's replies were unreliable. From the umbilicus upward, sensation was normal; but downwards from the umbilicus sensation became progressively worse until the mid-thigh was reached. From there to the periphery sensation was almost lost. Radiographs of the spine were normal.

On May 28 2 c.cm. of lipiodol was injected into the cisterna magna, and the opaque material was found to be held up at the lower border of the body of the 6th dorsal vertebra. Radiographs six days later showed no further descent of the lipiodol.

On July 3 a spinal exploration was carried out by Mr. W. W. Bassett. The spines of the 3rd to 9th dorsal vertebrae were removed. The dura was exposed and incised vertically, but the arachnoid failed to bulge out. It seemed as if the latter were adherent to the surface of the pia, for the usual "floating" appearance of the cord in the C.S.F. was not seen. The slit in the dura was extended downwards, but no other obstruction was found. About the level of the 7th dorsal vertebra the posterior aspect of the cord looked pale. The adhesions between the dura and arachnoid were separated by blunt dissection, and it was concluded that the lipiodol hold-up had been due to these adhesions. The dura was closed without opening the arachnoid. The patient made a good recovery from the operation, but no improvement occurred in the legs. On Aug. 1 it was noted that they were still spastic. Muscle and joint sense was gone. Vibration sense was present, reflexes were increased, and plantars were still extensor. Pressure sores developed on the skin of the heels.

No further recovery ensued, and the patient was transferred to her home to be nursed there. Nothing more was heard from her until Jan. 18, 1945, when she walked up to the hospital to allow me to examine her. Her subsequent history is interesting.

It is now 3½ years since the operation. Three months after leaving hospital sensation slowly began to return. She lay in bed unable to move for 1½ years after operation and then began to move her legs. Shortly after this she started to crawl around the house. This stage lasted three months, and then she got two sticks and walking improved further. The sticks were used until Sept., 1944, since when there has been no disability. Her longest walk up till now has been three miles, but she says she could go much further. Examination showed no spasticity in either leg and no wasting; co-ordination was normal. Sensation to all forms was normal. The reflexes were present and equal and the plantars were flexor. The cranial nerves and upper limbs were also normal. Apart from the healed wound on the back it would have been impossible to say that the patient had ever had spinal compression.

I am indebted to Mr. W. W. Bassett, F.R.C.S., surgeon at Lurgan and Portadown District Hospital, for his valuable help in this case.

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A report in the *Scotsman* states that the trustees of the Nuffield Provincial Hospitals Trust have agreed to make a substantial annual grant for a period of years towards the work of the rehabilitation department of Glasgow Royal Infirmary. The grant will be used to establish associated clinics in some of the outlying parts of Lanarkshire and neighbouring counties. It has been found that many patients attending the department did not complete their treatment at the Infirmary owing to difficulties and expenses of travel, and the new clinics should be of great value in encouraging patients to attend for the follow-up treatment and regular examination essential to the restoration of injured workers to full capacity for work. The facilities of the clinics will be available to all patients irrespective of the hospital they may be attending.

FRACTURES OF THE INTERNAL MALLEOLUS

BY

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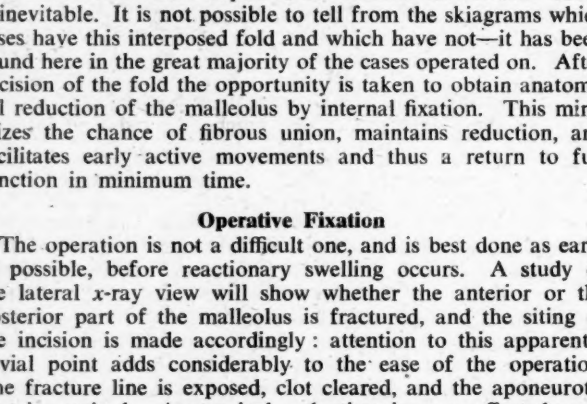
A certain proportion of fractures of the internal malleolus treated in plaster end in fibrous union. Though some of these have slight or no disability, others leave the patient with a painful limp or a stiff joint. To obviate the latter type of bad result it has been the custom here to perform an open reduction on these fractures.

For practical purposes the fractures may be classified as (*a*) fracture of the internal malleolus alone; (*b*) fracture of the internal malleolus complicated by fracture of the external malleolus and/or the posterior malleolus, or by diastasis. Attempted manipulative reduction of the vast majority of these fractures meets with only partial success. The chief factor militating against anatomical reduction is the indrawing of the periosteo-fascial covering of the malleolus into the gap between the fragments in a tense curtain-like fold. In the fortunate ones this fold does not extend as deeply as the cartilaginous surface, and union of the deeper part of the malleolus next to the joint restores the mortise of the ankle. In those less lucky, particularly where some displacement has occurred, the aponeurotic fold clothes the entire depth of the fracture and fibrous union is inevitable. It is not possible to tell from the skiagrams which cases have this interposed fold and which have not—it has been found here in the great majority of the cases operated on. After excision of the fold the opportunity is taken to obtain anatomical reduction of the malleolus by internal fixation. This minimizes the chance of fibrous union, maintains reduction, and facilitates early active movements and thus a return to full function in minimum time.

Operative Fixation

The operation is not a difficult one, and is best done as early as possible, before reactionary swelling occurs. A study of the lateral *x*-ray view will show whether the anterior or the posterior part of the malleolus is fractured, and the siting of the incision is made accordingly: attention to this apparently trivial point adds considerably to the ease of the operation. The fracture line is exposed, clot cleared, and the aponeurotic curtain excised. Anatomical reduction is now effected, particular care being taken that filleting of the small fragment is not done, because of the danger of subsequent ischaemic death.



The fragment is fixed by a long vitallium screw, which is introduced at a steep angle in order to avoid the angle of the joint mortise. The screw has to be long because of the poor holding quality of the cancellous bone into which it is introduced. Comminuted fractures, or fractures in which the fragment is too small to hold a screw, are not suitable for this method of fixation.

Active movements are started from the very next day, the leg being put up in a right-angled foot splint when at rest. In the uncomplicated variety full movements are generally obtained in two weeks. The patient is then allowed up on crutches, and goes through the movements of walking without actually taking weight: this reduces to a minimum the gravitational oedema which otherwise follows when the patient gets up after several weeks in bed. Full weight is taken at six weeks, when he walks with confidence and without a limp.

Our series of 20 cases (15 of them personal) comprise: (*a*) 13 in which the internal malleolus alone was fractured, one of them with comminution. Ten of these had full movements at or before six weeks, and two were evacuated at an early stage. The case with comminution had full movements at eight weeks. (*b*) Of the other seven, three had trimalleolar fractures, the posterior malleolar fragment involving less than a quarter of the articular surface and not being displaced. They obtained full movements at three, five, and six weeks respectively, and took full weight at six weeks. The remaining four had fractures of the external malleolus at varying levels, obtained full movements at an average of two and a half weeks, and took full weight at an average of seven weeks. Any associated external malleolar fracture or diastasis of the inferior tibio-fibular joint is not directly treated. Since the internal and external lateral ligaments are intact, the anatomical reduction of the internal malleolus pulls the astragalus into place, and this in turn reduces the external malleolus.

Summary

The cause of fibrous union which occurs in many fractures of the internal malleolus is an aponeurotic curtain-like fold interposed between the fragments.

Internal fixation following excision of this fold is recommended as a measure to ensure union, to obviate the use of external fixation, and to restore early function.

The method of operation is described and the results of 20 cases are given.

Medical Memoranda

Partial Atresia of the Cervix complicating Pregnancy

The case recorded below, which came under my care, may be thought interesting enough to merit publication.

CASE HISTORY

A primipara, aged about 27, was admitted on May 28, 1944. She had been carried to Calabar from a neighbouring village by canoe. On admission she gave a history of full-term pregnancy and of labour pains, which were said to have begun four days previously, but at the time of admission the labour pains had ceased. She was lightly built, emaciated, and appeared toxic. Temperature 102.4° F., pulse 144, respirations 24, and blood pressure 100/60. Pelvic measurements were: I.C. 9 in.; I.S., 8 in.; E.C., 7 in. On abdominal palpation the uterus was found to be tense and tender. The fundus was four fingers below E.C., with vertex presentation and left occipito-anterior position. The head was well down in the pelvis. Thirty-six ounces of urine was withdrawn by catheter: it was highly concentrated, with a heavy cloud of albumin; sugar was not present.

Vaginal examination showed oedema of the labia: the clitoris was normal. The vagina was about 2 in. in length and led to a blind alley, formed by the partially atresic cervix. In place of the external os were two "pin-hole" openings, about 3/4 in. apart. Through these small holes a few strands of the infant's hair were protruding, and very offensive liquor amnii was trickling out.

Treatment.—Under chloroform anaesthesia with gr. 1/100 atropine premedication the cervix was opened with a pair of scissors. Craniotomy was performed, and a female baby weighing 7 lb. 2 oz. extracted. The placenta was removed manually. Bubbles of gas and very offensive material came from the uterus on extraction of the placenta. There was brisk bleeding, but this was quickly controlled by the injection of 1 c.cm. of pituitrin. The foot of the bed was kept raised for six hours, and one pint of submammary saline given.

Subsequent treatment consisted of injection of one ampoule of soluble sulphapyridine, followed by two tablets of sulphapyridine four-hourly. As the temperature had not settled down by the end of the first week and the patient's condition was still unsatisfactory, sulphathiazole was administered in doses of two tablets four-hourly. The temperature settled down three days after giving this drug. Apart from oxytocic drugs, sedatives, and tonics, repeated administration of anti-gas-gangrene and antitetanus sera was found necessary. Local treatment consisted of a daily intra-uterine douche with 1 in 320 dettol followed by insufflation with powdered sulphapyridine.

The woman was discharged from hospital exactly one month after admission, June 28. At the time of her discharge she appeared to have gained weight, and she had completely recovered.

COMMENTS

This was undoubtedly a case of congenital partial atresia of the cervix, as there was no history of previous infection or trauma to suggest closure of the cervix by scar tissue or any evidence of scarring. I consider this case of peculiar interest in view of the generally accepted view that in this type of abnormality the internal genital organs are too much underdeveloped to permit of fertilization.

At this station one has no access to the literature, but I doubt if many such cases as the one described above are recorded.

I am indebted to the Director of Medical Services, Nigeria, for permission to publish this case report.

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Spontaneous Rupture of Rectus Muscle

Haemorrhage into the rectus sheath may result from a direct blow or a severe muscular strain, but there is the so-called "spontaneous" type, the cause of which is not so obvious. This latter condition is rare, and most surgeons of wide experience have seen few cases. It is well known that certain febrile diseases are complicated by muscle degeneration and that this may predispose to rupture of the muscle. Thus Virchow in 1857 described the rupture got in typhoid fever, and gave a detailed account of the hyaline degeneration present—a condition which later became known as Zenker's degeneration. Snyder (1939) has pointed out that the condition is also not uncommon in respiratory infections, especially influenza, and was noted during the epidemic in 1918. Haematoma of the rectus sheath is also found occasionally after the termination of pregnancy, and Torpin (1943) has summarized 27 cases which come into this category and has added one of his own.

The following is a case of haematoma of the rectus sheath which shows some unusual features and is worth recording:

CASE HISTORY

A carrier aged 36 was admitted to hospital with a painful swelling on the right side of the abdomen. Two weeks previously he had been suffering from boils on the side of his neck, and found about this time that he was having slight twinges of pain in the right side of the abdomen when he was cranking his motor lorry. The pain continued, but was never severe enough to prevent him from starting his lorry each morning. About a week after the pain had begun the patient noted a fullness in the right side of the abdomen. A few days later he found that there was a definite swelling present, and this enlarged up to the day of admission.

The patient was a healthy, well-nourished man who did not seem to be suffering much pain. There was a tender mass the size of a fist lying to the right of and slightly below the umbilicus. The condition was diagnosed as a rupture of the rectus muscle, and it was decided to operate and repair it. This was done on the day after admission. Under general anaesthesia an incision was made over the swelling. The rectus sheath was found to be distended with partially clotted blood and, after this had been evacuated, a transverse tear 1 cm. long was found 1.5 cm. below the level of the umbilicus. Suture of the tear was impossible because of the friability of the muscle, and the rent was thus made into a longitudinal one by removing small segments of muscle above and below; it was then sutured transversely. The patient made an uninterrupted recovery.

The pieces of muscle removed were examined histologically. The muscle fibres were swollen and the striations were absent, the appearance resembling that of Zenker's degeneration. Much blood-clot was seen extending between the fibres.

DISCUSSION

There are three interesting features about the case. First, the condition appeared to start during the time the patient was suffering from a septic process; secondly, the trauma applied to the rectus was not such as would normally rupture the muscle; and, thirdly, the histology suggested a degenerative lesion of the muscle fibres, although it is possible that this was due to the ischaemia of the fibres around the tear. It is thus tempting to postulate that the rupture of the rectus was predisposed to by a degenerative process secondary to the septic focus in the neck. It should also be noted, however, that there was some pain in the muscle for almost two weeks before the final large rupture, and it is possible that the repeated slight strains on the muscle caused by cranking a heavy engine had played an important part in producing the muscle degeneration.

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Reviews

LEUCOPENIA AND AGRANULOCYTOSIS

Leukopenia and Agranulocytosis. By William Dameshek, M.D. Edited by Henry A. Christian, M.D., F.A.C.P., F.R.C.P.Can. Oxford Medical Publications. (Pp. 74. 10s. 6d.) London: Oxford University Press.

This little book gives an excellent summary of the numerous observations which have been made on the occurrence of leucopenia and agranulocytosis, and at the same time on exposition of our ignorance of the physiological background of these events. "Definite leucopenia" is said to be present when the white blood corpuscles are below 4,000, though it is difficult to impose a standard owing to the variations in the white count in different individuals. Agranulocytosis is defined as an acute disorder characterized by constitutional disturbances, fever, sore throat, and extreme leucopenia. Leucopenia occurs in a variety of conditions, which are enumerated in detail. Agranulocytosis, on the other hand, is due in the great majority of instances to sensitivity to drugs, of which amidopyrine and the sulphonamides are the most important. It is probably an anaphylactic or allergic type of shock phenomenon with sudden arrest of production of granulocytes in the marrow. In the past, treatment has been chiefly concentrated on efforts to stimulate the marrow to make white cells. Therapeutic agents for this purpose have included *x* rays, nuclein derivatives such as pentose nucleotides, liver extract, leucocyte cream, and yellow bone-marrow; transfusions have also been used. The value of these agents has been much disputed, and it would appear that the marrow is already stimulated to a maximum degree by the infection which is present. Dameshek believes that a more rational therapy is to prohibit the offending drug and to endeavour to control the infection by sulphonamides (if the case is not due to sulphonamide sensitivity) or by penicillin. It seems probable, indeed, that penicillin will greatly improve the prognosis of agranulocytosis. So much, then, for empirical data. When we look deeper into the matter we find we know very little about the mechanism of leucocytosis in pyogenic infections, and still less about the leucopenia of virus infections, many protozoal diseases, and many forms of splenomegaly. This has been at any rate partly due to the relative inaccessibility of the bone-marrow; but the recent development of marrow puncture should make investigations easier. We also know very little of the process of sensitization to drugs, though this is a matter of increasing concern with the introduction of chemotherapeutic agents, such as the sulphonamides and thiourea. Dameshek's review is therefore timely in providing a base from which further advances may be made in these important fields of experimental and clinical science.

ALLERGY

Allergy. By Erich Urbach, M.D., with the collaboration of Philip M. Gottlieb, M.D. (Pp. 1,073; illustrated. 70s.) London: William Heinemann. 1944.

Allergy is one of the most loosely used words in medicine: it has even passed into common speech, where it is used in a sense hardly wider or less legitimate. If some definitions of it be accepted the term certainly covers a wide variety of phenomena, and anyone who can formulate principles to explain them is doing an important service. This is the commendable approach to the subject adopted by E. Urbach and P. M. Gottlieb, of the Allergy Service, Jewish Hospital, Philadelphia, in a massive tome of which the first considerable section deals only with fundamental principles and the experimental basis on which knowledge rests. Succeeding subjects are the principles of diagnosis and treatment, "etiologic agents" (which are classified as inhalants, ingestants, injectants, contactants, physical agents, and infectants), and finally the symptomatology and treatment of allergic diseases, which are here classified regionally. The practising physician will find many interesting ideas in this volume, though he may not accept all its doctrines. He may, indeed, be surprised how many commonplace phenomena or actual diseases are capable of explanation on an allergic basis. To invoke such an explanation for exanthematous rashes and a variety of skin diseases and for functional disorders of the respiratory and intestinal tracts is often reason-

able enough, but some much more startling attributions will be found here, as may be gathered from the fact that the diseases dealt with include angina pectoris, endocarditis, nephritis, cataract, and gout.

To attempt any critical assessment of the views expressed is impossible in a small compass: it must suffice to say that they are interesting and stimulating if sometimes rather far-fetched. The book is profusely illustrated, thoroughly documented, and evidently based on extensive and exceedingly varied clinical experience.

INTELLIGENCE AND ATTAINMENTS OF CHILDREN

The Scottish Council for Research in Education. Its Aims and Activities. Publications of the Scottish Council for Research in Education, XXIV. (Pp. 38. 1s.) University of London Press, Ltd., Malham House, Bickley, Kent.

The report of the Scottish Council for Research in Education is a valuable and interesting document which includes several points relevant to medical practice. These chiefly concern the intelligence and mental capacity of children, but the findings are of general importance. It is found that both in intelligence and in attainment the small country schools and the large town or city schools compare favourably with medium schools, probably because of more individual attention on the one hand and better organization on the other.

A survey in Fife on a batch of American achievement tests showed that 11-year-old Fife children are 16 months ahead of American children of the same age. A wider survey showed a smaller proportion than was expected of children two or more years retarded. The proportion above the standard, however, was smaller than expected. This may mean that the standard of education is suited only to the brightest children. The best basis for predicting future success seems to be a combination of I.Q. plus qualifying examination plus teachers' estimates (sealed). If only one method is used the examination carefully set and corrected by one competent examiner is held to be best. It was found that 7½% of boys are for all practical purposes colour blind. Unless special tests are used this generally goes undetected and the children may therefore be misjudged.

Two large surveys of Scottish children have been undertaken, one in 1932 and one in 1935–7. It would appear that the average I.Q. comes very close to 100 for boys, and with girls very slightly less. Exceptional children—i.e., those falling outside the limits of twice the standard deviation—for whom provision would have to be made are less than 5%, half of whom would be subnormal and half supernormal. One gathers that mental deficiency is rather less prevalent in Scotland than in England and Wales. The incidence is much alike in urban and in rural areas, though the interesting fact emerges that the highest average intelligence was found in the Highlands and Islands.

There seems little indication that the mental capacity of a child changes appreciably either through time or through circumstances, but the high scorers by no means always get into occupations suited to their capacity. This is a matter which should engage the attention of those responsible.

NEURASTHENIC STATES

Conceptions et Traitement des États Neurasthéniques. By J. Tinel. (Pp. 63. No price given.) Paris: Librairie J.-B. Baillière et Fils, 19, Rue Hautefeuille. 1941.

It is a real pleasure once again to have for review the work of a French clinician with his countryman's familiar brilliance of clinical description and logical deductions from direct observation. This little book on the neurasthenic states is most worthy of perusal. The author at first deprecates the use of the word "neurasthenic," but confesses that no other term is so expressive of the asthenic psychoneuroses which are so familiar in our hospitals and consulting-rooms. He regards the condition as a mixture of psychic disturbance and nervous disability characterized by a subjective fatigability which, however inconstant and variable it may be, is a real fatigue though it may not be demonstrated by specific ergographs, memory or concentration tests, and the like. The patients are essentially egocentric and are characterized by an obsessive hypochondriacal attitude. They exhibit certain physical disturbances such as headache, backache, insomnia, giddiness, paraesthesia, and disturbances of the digestive, respiratory, cardiovascular, urinary, and genital systems—the psychosomatic syndromes of modern terminology—and at the same time are depressed and retarded. The condition has been regarded by some, especially by Dejerine, as due to emotional shocks or prolonged states of disturbances of feeling and curable by faith, and by others as true psychoses—i.e., constitutional, possibly toxic, tending to phasic repetition and not amenable to direct therapeutic intervention: in fact mild and aberrant forms of psychotic depression. Although these concepts are contradictory, Dr. Tinel thinks they are both true: that on the one hand the sensibility to emotional influence is constitutional, and on the other hand the intervention of emotional situations may produce a condition leading to repeated attacks and permanent changes.

The author points out the dangers of thinking the condition is organic and wasting the patient's time, money, and confidence in senseless repetition of investigations and treatment. Equally dangerous and unjust is to describe the symptoms as imaginary; as Dejerine said, they are artificial but not imaginary. In treatment Dr. Tinel favours symptomatic therapy by appropriate physical and medical methods, and discusses the difficulties of achieving an automatic balance by pharmacological means. But causal treatment must be by psychotherapy. Crude suggestive methods, and in all but a very few cases deep psycho-analysis, are deprecated. What is required is sympathy and clear explanation so that the patient realizes the meaning of his illness and the nature of his own personality. Perhaps there is little new in this, but the presentation is so clear and so commendably brief that it is to be recommended to all doctors.

Notes on Books

We have received from Messrs. Taylor and Francis Ltd., Red Lion Court, Fleet Street, London, E.C.4, the *Annals of Science*, Vol. 5, No. 3, July, 1945. This admirably conducted journal began as a quarterly in 1936 and is devoted to the history of science since the Renaissance. It was compelled to cease publication in 1942 in the midst of its fifth volume. We welcome the continuance of this volume. Dr. Sherwood Taylor, in a clear and well-illustrated article on "The Evolution of the Still," trespasses rather beyond the special period of the *Annals*, but throws much light on this subject in tracing the history of this instrument from the early Christian centuries to modern times. Dr. K. J. Franklin, equally well known for his historical studies and his researches on the vascular system, in a description of a seventeenth-century theory on the foetal blood flow, gives a new view on the scientific quality of the French Académie at the time. Prof. J. R. Partington, our leading authority on the history of chemistry, deals with the familiar ground of hydrocarbon flames and records milestones in the advance of knowledge of the subject. The number is completed with articles by Dr. Millington on "Theories of Cohesion," Dr. Dobbin on the "Discovery of Phosgene Gas," and Prof. Patterson and Dr. Buchanan on the crystal forms of the tartrates. Dr. McKie and his fellow-editors are to be congratulated on having maintained so high a scientific standard in the very difficult times in which the *Annals* has recommenced its career.

Essentials of Local Anaesthesia in Dentistry, by A. CORNFORD BOWDEN, is published at 6s. by John Wright and Sons, of Bristol. This small book condenses into 50 pages the essentials of dental analgesia and has been written to help the dental student in his study of the anatomy and innervation of the teeth and jaws. It is wisely emphasized that most dental extractions and fillings can be carried out under a simple infiltration anaesthesia, or in the case of the lower jaw by an inferior dental nerve block. A clear technique is given for the last-named injection, which has become so popular and useful during recent years.

Some local authorities may be applying to be allowed to continue in peacetime a limited service of British Restaurants, mainly for the use of industrial and commercial workers. *Community Restaurants in Design*, published by the London Council of Social Service, 7, Bayley Street, London, W.C.1, at a price of 2s. 6d. post free, sets out two plans considered suitable for such restaurants. Local conditions would probably entail modification of either plan, but it is suggested that the principles embodied in them should be seriously studied by organizers and designers of separate restaurants or of restaurants incorporated into other buildings. The architectural designs are presented in two coloured plates, and should be studied in conjunction with the written report. The booklet is written by F. le Gros Clark, with designs by L. H. Bucknell and Ruth Ellis, and a foreword by Sir Wyndham Deedes.

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THE DISSEMINATION OF POLIOMYELITIS

The mode of transmission of acute anterior poliomyelitis remains in some doubt in spite of the attention given to the subject since the disease was first recognized as communicable by Medin in 1890. In its endemic form infantile paralysis behaves like any other disease of low invasiveness which may gain entry either by the respiratory, or the alimentary, or the cutaneous routes. The virus appears to be widespread, and it is believed that many harbour and disseminate it without showing the usual manifestations of the disease, so that the source of infection is almost never traced and the channel or vehicle cannot be ascertained. In most epidemics the links between paralytic cases are not obvious, although the Victoria outbreak of 1937-8 differed in this respect, and multiple cases in houses are uncommon. Careful inquiry during an epidemic usually reveals contemporaneous febrile illnesses of an indefinite type, often in members of families in which there is a paralytic case, which may be, and probably are, poliomyelitic infections. If these be accepted as infective poliomyelitis without such destruction of nerve cells as causes paralysis, the course of an epidemic is compatible with case-to-case infection. The summer and autumn season at which poliomyelitis prevails is, however, different from that of the common air-borne infections, and this has led epidemiologists to doubt whether it belongs to this group. The fact that it is not a disease in which gastro-intestinal disturbance predominates made them look first for an insect vehicle rather than alimentary channels of infection, although a few small epidemics in America pointed to milk, and Aycock's careful epidemiological analysis of the Broadstairs and Ramsgate outbreak of 1926, which led him to believe that it was milk-borne, has not received the attention in this country which it deserves.[1] The biting stable-fly (*Stomoxys calcitrans*) seemed a possible carrier of the infection, at least under experimental conditions, but this has never been confirmed by the investigation of human outbreaks. The fact that the virus has been isolated occasionally from house-flies is no proof that they play an important part in transmission, and, in any case, they merely act as mechanical agents of alimentary infection.

The experiments of Fairbrother and Hurst[2] in 1930 and subsequent work in America by Faber and Gebhart,[3] indicating that the virus gained entry to and multiplied in the olfactory area of the nasal lining and spread by axonal channels into the brain-stem and cord, sharply turned our minds back to the theory that poliomyelitis is air-borne, especially as it accords with the epidemiological behaviour of the disease if its seasonal incidence is discounted. This view was hardly challenged for ten years, but in the meantime new facts were gathering. The presence of the virus in the faeces of patients and contacts was increasingly demonstrated. Kling and his colleagues in Sweden[4] had found the virus in drinking-water; these workers,[5] and Paul and his colleagues in Detroit,[6] isolated it from sewage. Faecal contamination and alimentary infection could no longer be disregarded. The post-mortem findings of Graeme Robertson during the epidemic in Victoria threw doubt on the olfactory bulbs as a channel of entry, and led Burnet, who had hitherto accepted this route of infection,[7] to say in 1942 that "there can be no real doubt that spread from the alimentary tract to the central nervous system does occur in the individuals who develop paralysis, mild or severe."[8] His view now is that poliomyelitis is an infection of the alimentary tract which may or may not involve the throat. If it does, salivary contamination and droplet spread may play a part, but, as the virus "is liberated in the faeces of all persons with virus infection," particular care should be devoted to training children in the most practical ways of avoiding faecal contamination.

The development of laboratory technique provides a tool which should be capable of forcing a way to more precise knowledge of the spread of infection. H. C. Pearson and R. C. Rendtorff and their colleagues,[9 10 11] of the School of Public Health, University of Michigan, have made detailed studies of several groups of sporadic cases in isolated farms, villages, and small towns, and of an epidemic in a large town. Family and remote contacts have been traced, any history of abortive poliomyelitis ascertained, and their stools examined for virus. Insects of many species, rodents and their parasitic insects, faeces from farm animals, and samples of water, milk, and sewage were investigated. The magnitude of the undertaking may be gathered from the facts that in one village where a single case had occurred faecal specimens were obtained from 127 members of all but one of the 39 families living there; in a small town of 1,350 inhabitants where two cases had occurred 282 stools were collected from children under 16 of all but three of the 146 families; in a large town specimens were obtained from 524 persons, including familial and non-familial contacts and persons (374) without known contact; and altogether nearly 10,000 insects of numerous species were examined.

Briefly the results were that virus was isolated most frequently from the faeces of persons who were close family contacts with a known paralytic case, less frequently from those with more remote contact, and very seldom among those who had no connexion with such a case. For instance, during an epidemic in the large town virus was found in members of 6 of 8 households where a case had occurred, the majority of the individuals harbouring it being over 17 years of age; in 8 of 45 households having contact outside the home with paralytic cases; but in only 2 of 127 households whose inmates had no known contact. Positive laboratory findings were not specially associated with a history of indefinite illness. Poliomyelitis virus was

1 *Amer. J. Hyg.*, 1927, **7**, 791.
2 *J. Path. Bact.*, 1930, **33**, 17.
3 *J. exp. Med.*, 1933, **57**, 933.
4 *Acta med. scand.*, 1942, **112**, 217.
5 Ibid., 1939, **102**, 629.
6 *J. exp. Med.*, 1940, **71**, 765.
7 *The Biological Aspects of Infectious Disease*, 1940, Camb. Univ. Press.
8 *Commission of Publ. Health, Victoria: Health Bull.*, 1942, No. 71, 1911.
9 *Amer. J. Hyg.*, 1945, **41**, 164.
10 Ibid., p. 179.
11 Ibid., p. 188.

not found in any pool of material from insects, animal faeces, water, sewage, milk, or rodent intestines, and only once was a virus of indeterminate character found in a pool of rat brains. Extra-human sources of infection, therefore receive no support from this inquiry. Although the faecal samples were usually collected some time after clinical cases had occurred, and the authors are reserved as to the efficacy of the methods of demonstrating the virus (which they describe in detail), nevertheless the close association of positive laboratory findings with cases of paralytic poliomyelitis strengthens the conviction that infection is from case to case, whether clinical or subclinical, and that the control of the disease depends on early diagnosis and the management of contacts. This accords with the experience of Victoria in 1937–8. Seddon and his colleagues,[12] from their study of the Malta and Gozo outbreak, also concluded that food, water, and insects were not implicated. These writers assumed, however, that dissemination took place by nasopharyngeal droplets and droplet nuclei. It is unsafe to make this assumption from the rapidity of spread and the form of the epidemic wave. The behaviour of Sonne dysentery in this country during the winter of 1937–8 shows that an alimentary infection can follow a similarly rapid course even where there is no common source in the form of food or drink. Diarrhoeal diseases occasionally sweep through even well-conducted children's wards. The living conditions in camps and barracks are somewhat analogous to those in hospital, and if non-immune Service men were exposed to an invasive strain of poliomyelitis virus of which there were numerous hidden foci, it is conceivable that rapid dissemination might ensue by ingestion. From his experience in India, and especially because of the fact that far more officers than other ranks have been affected—the standard of hygiene in officers' mess kitchens as compared with that of other ranks in India being demonstrably lower—D. McAlpine[13] believes that poliomyelitis may be conveyed by food, but that the method of transmission may vary as between one group of cases and another.

MALIGNANT TUMOURS OF THE NASOPHARYNX

Malignant tumours of the nasopharynx have been estimated to comprise only 0.4% of all malignant tumours. The non-malignant form, nasopharyngeal fibroma, is still more rare, and usually seen in males between 15 and 25 years of age; it can be removed, though the operation is severe and bloody. The malignant tumours, however, have not yielded to surgical attack, though every possible form of approach and osteoplastic exposure have been tried. The anatomy of the region discourages this form of treatment. With the failure of surgery we have to rely upon radiotherapy, and it is time to take stock of the results obtained.

A comprehensive study of 454 cases has been undertaken by Erik Godtfredsen[14] (Copenhagen), the records having been drawn from four radiological clinics—those of Copenhagen and Aarhus in Denmark, the "King Gustav Vtes Jubilaeumsklinik" in Lund, and the Radiumhemmet in Stockholm. The period under review extended from 1927 to 1942 inclusive, and attention has been focused on the ophthalmic and neurological complications, estimated at 38% and occurring in 172 of the cases. Many of the tumours were so immature and anaplastic that classification was difficult; the author has adapted that used by Ringertz[15] for carcinoma of the nose: (1) cylindrocellular carcinoma; (2) squamous carcinoma (that is, of epidermal type); (3) metaplastic carcinoma (squamous carcinoma with signs of originating from cylindrical cells which have undergone metaplasia); (4) undifferentiated carcinoma. It is also difficult to classify the sarcomas which arise in the lymphatic tissue of the nasopharynx. Godtfredsen includes here the much-debated lympho-epithelioma, in which Ringertz has demonstrated fibrils by silver impregnation, and the transitional-celled carcinomas. The presence of argentophil fibrils is regarded as evidence of mesodermal origin, and the absence of keratosis and the clinical characters, including the pronounced sensitivity to radiation, support this. There is still lack of agreement on this, but it was decided to include as sarcomas all tumours appearing to arise in cells of the reticulo-endothelial system. Differences of classification explain the differences in the percentages of carcinoma and sarcoma previously published.

Of the total number (454) of cases 438 were verified histologically: there were 243 carcinomas and 195 sarcomas. There were 172 cases of squamous-celled carcinoma and 166 of reticulum-celled sarcoma. The high proportion of the latter is explained by the classification adopted. There were 61 cases of undifferentiated carcinoma, 17 of lymphosarcoma, and 12 of plasmocytoma. There were a few other tumours of rare type, including one chordoma. About 80% of this series of nasopharyngeal tumours were of the anaplastic type with a low grade of differentiation. Of the 438 verified cases there were ophthalmic and neurological complications in 158; it appears that the squamous-celled carcinomas are particularly apt to invade the base of the skull, generally extending by the foramen lacerum medium. Fifty-three per cent. of all the patients fall into the age group of 41–60, the average age being 49 years—51 for patients with carcinoma and 46 for those with sarcoma. Of the 454 patients 294 were males and 160 females.

The local symptoms of nasal obstruction—discharge and epistaxis—are sometimes overshadowed by the more remote effects. Obstruction of the Eustachian tube causes deafness and effusion into the tympanum, and when the tumour invades the base of the skull palsies may affect any of the cranial nerves. Ophthalmoplegia, neuralgia, headache, paralysis of the palate, larynx, and tongue occur in a variety of syndromes. Enlarged glands in the neck beneath the upper attachment of the sternomastoid may press on the jugular foramen, and the primary focus of disease pass unrecognized. Correct diagnosis is often delayed, and Gordon New[16] recorded that tonsillectomies, intranasal operations of different kinds, operations on the ear and the Gasserian ganglion, dental extractions, and cran

[12] *Quart. J. Med.*, 1945, **14**, 1.
[13] *Lancet*, 1945, **2**, 130.
[14] *Acta otolaryng. Stockh.* Supplementum LIX.
[15] *Acta otolaryng. Stockh.*, 1938, Supplementum XXVII, 95.
[16] *J. Amer. med. Ass.* 1922, **79**, 10.

otomies have been performed before the diagnosis has been established. To confirm this, *x*-ray examination of the nasopharynx shows an asymmetrical shadow with indefinite outline, dislocation of the upper surface of the soft palate, and evidence of destruction of the base of the skull, particularly in the region of the foramen lacerum medium.

The most common initial palsy—often the first symptom—affects the 6th nerve: next in order are the 5th, the 3rd, and the 4th nerves. Shelden[17] in 1921 drew attention to neuralgia caused by infiltration of the Gasserian ganglion. Paralysis of the hypoglossal may appear with symptoms of pressure on the jugular foramen. Paralysis of the 7th nerve is rare, as also is paralysis of the sympathetic. The commonest initial symptom, however, is enlargement of the cervical glands (especially in sarcoma), followed by aural, nasal, and neurological symptoms (especially in carcinoma).

X-ray examination showed that destruction of the base of the skull is five times as frequent in cases with as in those without ophthalmic and neurological symptoms. That no bone destruction could be demonstrated in some of the former may be due to invasion of the cranial cavity through the basal foramina, as Shelden described. Destruction of bone without cranial-nerve palsies is explained by limitation of the process to the base of the pterygoid process. The destruction is nearly always unilateral and in the neighbourhood of the foramen lacerum medium (spheno-petrous fissure), so that the tip of the petrous portion of the temporal bone, the great wing of the sphenoid, including the foramen ovale and the foramen spinosum, the body of the sphenoid bone, and the edge of the basilar process would be attacked. This corresponds to the common site of origin on the lateral wall of the nasopharynx, which Trotter[18 19] described, and constitutes about 80% of the cases in which the base of the skull is invaded. The third type of invasion is a mesial destruction of the body of the sphenoid bone, which includes the sella, posterior clinoid processes, and sometimes the clivus further back as well. This situation is likely to produce ocular symptoms without affection of the 5th nerve. Pulmonary metastases were found in 3 cases only.

It will be inferred from this condensed review of an elaborate and detailed investigation that early diagnosis of tumours of the nasopharynx is not the rule, and that when diagnosis is made invasion of the base of the skull, the surrounding tissues, and the lymphatic glands in the neck has already often occurred. The success of radiotherapy must be due to the anaplastic lowly differentiated character of many of the tumours, which are very sensitive to radiation. A collection of 540 cases of nasopharyngeal tumour reported by eight different writers showed that 62 patients were free of symptoms for five years or more (that is, 11.4%), but only 10 of them had carcinoma; of the remaining 52, 24 had lymphosarcoma, 25 lympho-epithelioma, and 3 reticulum-celled sarcoma. The prospects of cure in this series were five times better for sarcoma than for carcinoma, as there were 270 of each in the whole series; and better results were obtained in the lympho-epitheliomas than in the lymphosarcomas.

[17] *J. Amer. med. Ass.*, 1921, **77**, 700.
[18] *Proc. roy. Soc. Med.*, 1910–11, **4**, Otological Sect. 68.
[19] *British Medical Journal*, 1911, **2**, 1057.

There was much difference in the details of the methods used at the four different clinics, especially between the Swedish and Danish institutions. The periods of treatment varied from 24 to 72 days and the dosage from 3,300 *r* to 10,000 *r*. Radium and *x* rays were both employed. With the exclusion of patients treated after May, 1938, there were 266, of whom 117 had either ophthalmic or neurological symptoms. Altogether 59 of the 266 were found free of symptoms for five years or more—that is, 22.2%. Only 13 of the 117 patients with evidence of intracranial extension (that is, 11.1%) were free from symptoms for five years. Of the cases with glandular enlargement there were good results only in 18.8%, compared with 32.5% for cases without cervical enlargement. The poorest results were in the cases of squamous carcinoma: no patient with the epidermal type survived; of the patients with the other types of carcinoma 18 survived. There were 38 survivors among the patients with sarcoma; of these 32 had reticulum-celled sarcoma, 4 lymphosarcoma, and 2 plasmocytoma. It was found that many of the patients became symptom-free as an immediate effect of the treatment (327—or 72.1% of the 454), but in 167 there was a recurrence. There were, however, among the patients free from symptoms for four years 2 with epidermal squamous carcinoma. The best results have been obtained, alike in males and females, in patients under 40. Most recurrences are during the first year after treatment, but 9 cases of recurrence have been observed after more than five years.

WOMEN ON WAR WORK

In a study[1] of women on war work in four factories Dr. S. Wyatt and his five assistants describe the continuation of an earlier statistical study of sickness absence among women in industry (Report No. 86 of Industrial Health Research Board). In that report it was shown that a comparatively small proportion of the women were responsible for the greater part of the time lost through sickness, so a detailed comparison was now made between groups of women who had the most sickness absence and those with the least. In all, 250 women in each of these classes were interviewed, the interviews lasting from 30 to 60 minutes. Detailed information was sought about their reactions to numerous conditions inside the factory, such as physical environment, personal relations, and hours of work, and to various factors outside the factory, such as transport and home life. As a rule the two classes of workers reacted in more or less the same way, but in a few respects they showed wide differences. Rather over half of all the women were satisfied with the atmospheric conditions of the factories, and nearly all of them were satisfied with the lighting. No less than 94% of them appeared to be satisfied with their fellow-workers, but only two-thirds were satisfied with their supervisors. Some of the workers were on day rates of payment and others on piece rates, and, rather unexpectedly, substantially more of the former than of the latter were satisfied with their wages. Many of the piece workers did not like the rush of work, and they were afraid that their piece rate might be cut, while the day workers, though they earned less, had the satisfaction of knowing that their wages were independent of the output. Various systems of shift work were in operation at the factories, half of all the workers being on the three-shift system, a fifth on two shifts, and the remainder

[1] Wyatt, S., and assistants: *A Study of Women on War Work in Four Factories*. Report No. 88 of Indust. Hlth. Res. Bd., 1945, H.M. Stationery Office, price 9d.

on one shift. On the three-shift system they all changed over every week between morning, afternoon, and night work, and they put in, on an average, 45 hours of work a week. The arrangement of hours varied much in the different factories, but the women did not complain, over 90% being satisfied. The morning shift was by far the most popular, because it provided opportunity for recreation and amusement in the late afternoon and evening. The night shift was the least popular, but night work (under three-shift and two-shift systems) was not so unpopular as might have been expected. Only 36% of all the women definitely disliked it, chiefly because they could not sleep well in the daytime. Two-fifths of the women got less than 6 hours in bed, and only 14% got over 8 hours. Appetite was liable to be upset, leading to digestive troubles. No less than 55% of the women showing most sickness absence said that their health had been impaired by factory work, as contrasted with 37% of the women showing least sickness absence, and 15% of the former said that their work induced excessive fatigue, as contrasted with 8% of the latter.

As regards duties outside the factory, the married women naturally suffered more than the single women, 46% of them having to do all their housework and shopping, as contrasted with 12% of the single women. Again, 66% of the married women, but only 34% of the single women, suffered from home difficulties in general, including the care of children, the women who had most sickness absence suffering much more than the others.

Simultaneously with the publication of Report No. 88, the Industrial Health Research Board issued a popular illustrated pamphlet[2] embodying a summary of its contents and of Report No. 86. This ought to be of great value in propagating information about the health of women in factories, and in indicating the need for further research.

CHEMOTHERAPY OF FUNGOUS DISEASES

The chemotherapy of fungous diseases is still in its infancy, but research is being devoted, especially in the United States, to the discovery of new fungicidal drugs. Keeney, Ajello, and Lankford[3 4 5] report the results of three separate series of experiments *in vitro* to determine the fungistatic value of (*a*) sodium propionate and salts of other fatty acids of the same series, (*b*) drugs of the sulphonamide group, and (*c*) penicillin. Cultures of the more important pathogenic fungi causing superficial or deep mycoses were used in the tests. Sodium propionate, which is used in the confectionery trade to prevent mould growth in dough and cake mixtures, was found to be fungistatic to many pathogenic fungi. Salts of other fatty acids of this series—valeric, caproic, caprylic, capric, and undecylenic acids—were also fungistatic, and this property appeared to increase with the length of the carbon chain of the fatty acid, so that sodium caprate and sodium undecylenate were more fungistatic than the others. Tests showed that fungicidal power also increased with the length of the carbon chain of the acid, but the lowest member of the series used, sodium propionate, was not fungicidal although fungistatic. All salts in the series were in some degree toxic to white mice; and the greater the fungistatic power the greater the toxicity; therefore the therapeutic value of these salts for the deep mycoses cannot be determined until their toxicity has been more fully investigated. Of their usefulness in the treatment of the epiphytic diseases, especially ringworm of the feet, there is no doubt, the most efficient being sodium propionate and sodium undecylenate, for although the former is not fungicidal it is, in greater measure than the undecylenate, antibacterial against *Staph. aureus* and Group A haemolytic streptococci, occasional secondary invaders complicating foot ringworm.

The results of *in vitro* tests with the sulphonamide drugs in the treatment of superficial or deep mycoses were not encouraging, but evidence justified a clinical trial of sodium sulphamerazine in chromomycosis and of sodium sulphathiazole in histoplasmosis. In spite of the favourable clinical results reported by other writers, Keeney and his colleagues were not impressed by the effect of sulphonamides on actinomycosis. Penicillin was found to have no inhibitory effect on the growth of any of the pathogenic fungi investigated except *Actinomyces bovis*; in fact, in many instances it stimulated the growth of a fungus, and therefore might prove harmful in clinical use. Although, *in vitro*, penicillin is lethal to *Actinomyces bovis*, and in spite of recent reports of impressive cures from its use in actinomycosis caused by both *A. bovis* and the aerobic types of *Actinomyces*, Keeney and his colleagues conclude that these reports "do not warrant unrestricted enthusiasm for this mode of therapy."

In the treatment of ringworm, especially the form known as "athlete's foot," sodium propionate and sodium undecylenate are employed in ointments with the following formulae: Propionate-propionic acid ointment: sodium propionate 16.4, propionic acid 3.6, propylene glycol 5, N-propyl alcohol 10, zinc stearate 5, "carbowax (4,000)" 35, water sufficient to make 100. Undecylenate-undecylenic acid ointment: undecylenic acid 10, triethanolamine 6, propylene glycol 14, "carbowax (1,500)" 10, "carbowax (4,000)" 40, water sufficient to make 100. The water-soluble carbowax base, which aids the penetration of the antifungal substance, is to be preferred to a petrolatum base.

Keeney and his colleagues[6] found the above two ointments to be superior to Whitfield's ointment and to 10% ammoniated mercury ointment in their fungistatic action on cultures of a selected strain of *Trichophyton mentagrophytes* (a common cause of athlete's foot); the propionate ointment was superior to the other three in antibacterial action against *Staph. aureus* and a Group A haemolytic streptococcus. The results of clinical tests on cases of athlete's foot, although not conclusive, suggested that the propionate ointment was probably more effective than the undecylenate; both, however, fulfil the requirements of a good therapeutic agent for foot ringworm in being fungistatic or fungicidal and antibacterial; possessing the power of penetration; and being free from irritant or sensitizing properties even when used over long periods.

CATALOGUE OF MEDICAL FILMS

The Scientific Film Association, as our readers are well aware, was formed in 1943 to act as a centre for the collection, collation, and distribution of scientific films and, by promoting their use, to achieve a wide understanding and appreciation of scientific methods and outlook. It is governed by a council, which has set up special committees to advise and help it in specialized fields. The Medical Standing Committee, which was inaugurated in July, 1944, under the chairmanship of Mr. McAdam Eccles, soon found that its services were in great demand, and an executive committee was formed in October, 1944, which has met twice monthly since then. The preparation of a catalogue of medical films, which is the subject of a letter in our correspondence columns this week, is a work of outstanding importance, for when completed it will list all the medical films known to exist in Great Britain, and will record under

[2] Pamphlet No. 3 on Conditions for Industrial Health and Efficiency: *Why is She Away?* Indust. Hlth. Res. Bd., 1945. H.M. Stationery Office, price 4d.
[3] *Johns Hopk. Hosp. Bull.*, 1944, **75**, 377.
[4] Ibid., p. 393.
[5] Ibid., p. 410.
[6] *Johns. Hopk. Hosp. Bull.*, **1944, 75**, 417.

each title a summary of content and a critical appraisal prepared by a panel of experts, as well as the usual details of availability and length. As new films are completed details will be issued in supplements, and notes will be given of those withdrawn from circulation. A comprehensive recording system is used, which other countries, including some members of the British Commonwealth, now have under consideration. The catalogue will probably be published part by part, and first instalments may be expected towards the end of this year. During the second series of medical film programmes presented by the Medical Committee of the Association at the Royal Society of Medicine, 18 films, covering a wide range of subjects and methods of presentation, were screened to audiences averaging over 200. A new selection is being planned for the autumn which will be devoted to a number of the more specialized subjects. In addition to this work on films which already exist, the committee is drawing up, for publication this autumn, a memorandum on films which need to be made immediately for use in teaching. The honorary secretary is Dr. Brian Stanford, and inquiries about its general activities should be sent to him at the Scientific Film Association's address: c/o Royal Photographic Society, 16 Princes Gate, London, S.W.7.

FALSE POSITIVE TESTS FOR SYPHILIS IN MALARIA

For many years it was thought that malarial infection might cause false positive reactions for syphilis, but it is only recently that the percentage of these was known to be considerable. Immediately after the last war a series of tests was carried out at the Military Hospital, Rochester Row, and though several cases of malaria gave positive reactions, all, or nearly all, were proved to have syphilis as well. In 1920 Iyengar[1] found no positives in 98 cases; in 1921 Pratt Johnson[2] and in 1924 Altounyan[3] stated that malaria had no appreciable effect on the Wassermann reaction, and another observer, after carrying out several hundred thousand Wassermann and Kahn tests in India and in the United Kingdom, always taught until recently that malaria should not be the cause of false positive reactions in a well-balanced test. In the last few years, however, more and more false positive reactions have been reported, and it may well be that this is due, in part at all events, to the increasing sensitivity of the various serum tests employed. Cumming and his colleagues[4] recorded percentages of from 8.6 to 20.6 in a series of tests carried out by thirteen pathologists, while Kitchen and his colleagues,[5] treating with malaria 25 non-syphilitic patients with functional psychoses, obtained a positive reaction with a complement-fixation or flocculation test at some stage in every case. There are many more examples in recent literature, and it may be accepted that malaria can give rise to false positive reactions. It is not known what is the frequency of these, at what stage (before, during, or after the fever) they are most common, or how long they may persist. It seems probable, however, that false positive reactions tend to disappear within three, and usually within two, months of an attack.

How, therefore, should one interpret a positive serum test for syphilis in a patient known to have, or suspected of having, malaria? The Kahn "verification test,"[6] whereby true reactions may be distinguished from false by incubation at 37° C. and 1° C., when true reactions will occur with the former and false with the latter, may be helpful on occasions, but is not altogether reliable. Cox and Durant[7] state that if a series of Wassermann and Kline tests is carried out, and if there are discrepancies in the results and no history of syphilis, syphilis may be excluded. Brown and his colleagues[8] recommend treating the serum to be tested with N/3 sodium hydroxide before inactivation, and assert that by this method non-specific reagin is destroyed or removed. Rosenberg[9] claims to be able to distinguish between positive reactions due to malaria and syphilis respectively by the "pattern of positivity," employing six tests—Kahn, Kolmer, Mazzini, Eagle, Hinton, and Kline. Of these the Hinton test gave the lowest number of false reactions. There is also the fact that positive reactions due to malaria rarely persist beyond six weeks. Potter and his colleagues[10] found twelve positive Wassermann or Kahn reactions in 100 cases of malaria; but all these reverted to negative within 30 days, with an average of 12 days, and many in 7 days or less; in each the Wassermann reaction of the cerebrospinal fluid was negative. Rosenberg[11] states that if 0.35 c.cm. of saturated ammonium sulphate is added to 1 c.cm. of inactivated patient's serum syphilis reagin is precipitated but malarial antibody is not, and that the two can be distinguished by this means.

The value of few of the above methods has been confirmed, and it will be wise for the present to be sceptical of any serological method said to distinguish between true and false reactions. Where a false positive reaction occurs in a patient who has no history or clinical signs of syphilis, and more particularly if he is suffering, or has recently suffered, from malaria, the test or tests should be repeated. A reaction due to malaria is generally weak, tends to become weaker with lapse of time (here quantitative tests are useful), and invariably reverts to negative sooner or later—almost always within three months. Syphilis should never be diagnosed merely on the strength of a single positive test; such a procedure is unscientific, and unfair to the patient.

ADVERTISEMENTS OF PERMANENT APPOINTMENTS

The Council of the B.M.A. has decided that advertisements of permanent medical appointments which do not invite applications from practitioners serving in H.M. Forces and allow at least four months for the receipt of applications should be refused publication in the *British Medical Journal*. In the event of an employing authority declining to bring an advertisement into conformity with the policy of the Association the appointment in question will be included in the "Important Notice" in the *Journal*. If an advertisement of a permanent medical appointment the wording of which conflicts with the policy of the Association is published in a newspaper, an announcement in the form of the "Important Notice" will be inserted in the same newspaper. The policy of the Association in regard to advertisements of permanent medical appointments at the present time, as recently explained to hospital authorities, has been communicated to employing authorities generally.

The King has approved the appointment of Sir Lionel Whitby to the vacant post of Regius Professor of Physic at the University of Cambridge.

1 *Ind. J. med. Res.*, 1920, **8**, 136.
2 *J. Path. Bact.*, 1921, **24**, 145.
3 *Lancet*, 1924, **1**, 73.
4 *Vener. Dis. Inform.*, 1935, **16**, 189.
5 *J. Amer. med. Ass.*, 1939, **112**, 1443.
6 *Amer. J. Syph.*, 1941, **25**, 151, 157, 162, 173.
7 *Med. J. Austral.*, 1945, **1**, 320.
8 *Amer. J. Syph.*, 1945, **29**, 200.
9 *Bull. U.S. Army med. Dept.*, 1945, No. 84, 74.
10 *J. Amer. med. Ass.*, 1945, **127**, 699.
11 *J. Lab. clin. Med.*, 1945, **30**, 149.

MEDICAL PHOTOGRAPHY IN HOSPITAL

[FROM A CORRESPONDENT]

Research into methods of hospital photography in this country is sorely needed. Excellent work has been done under poor conditions, but how much more efficiently it can be turned out from well-planned, well-equipped laboratories is shown by the excellent illustrations reaching us from America. It is no good British doctors demanding pictures comparable with these, however, unless the same facilities are available.

The first thing needed for a medical photography department is a complete system of air conditioning, not only to draw out dust, soot, fumes, and bad air, but also to maintain the temperature at a certain level. All normal processing has to be done within a limited range of temperature; above this level gelatin melts, films frill, and other things go wrong, and below it some chemicals refuse to work at the same speed and so interfere with the balance of densities. Next a mobile unit (camera and lights) and a miniature camera with synchronized flash should always be in readiness for work in the theatre, wards, and departments. Electric fittings all over the hospital should be of one pattern so that mobile units can be plugged in anywhere, and lighting units should be so designed that one does not continually fall over leads and tripods.

Scope of Hospital Photography

For too long hospital photography has been done by radiographers or not at all. Radiographers are trained in photography relating to their own job—the interior of the body—and the technique is very different from that for the exterior and for the numerous jobs of a clinical photographer. Because of this and because more and more work is falling on both departments, the photographic department should be staffed by experts and possess suitable apparatus. Photographers carry on the good work of the radiographers by reproducing from the radiographs small-sized duplicate films or lantern slides for teaching and prints for publication. But this is only one of the jobs falling to them. In the clinical work of the hospital they may be called upon for full-length photographs of figures or limbs to show position; "close-ups" for detail of lesions, ulcers, etc.; photographs of cavities, swellings, skin reactions, etc., and, for the pathological department, of specimens and also photomicrographs. The demands for photomicrography and cine-photography are increasing, and the value of colour in diagnosis is being more appreciated. All departments want photographs of apparatus, surgical instruments and appliances, and copies of drawings, charts, photographs, etc.

Further photographs provide permanent records of the exact clinical condition at the moment of taking, and when a series are made over a period of time the doctor can see immediately the changes that have taken place. Such photographs filed with a patient's history are time-saving; they are also helpful in planning treatment, and invaluable for purposes of comparison in investigations. A photograph in a published paper will show at once what might otherwise take pages of reading matter to explain.

Scheme for a Hospital Department

The following is a brief outline of a scheme for a hospital photography department. It might be possible for one hospital in ten to build such a department, and by catering for the other nine to become, eventually, self-supporting.

Staff.—Director (fully qualified medical photographer); secretary to the director; three senior photographers (1 colour); three junior photographers (1 colour); clerk to the photographers; four first-year students; four second-year students; and a cleaner-porter. Salaries as fixed by the Institute of British Photographers.

Duties.—One senior and one junior photographer, known as operators, are responsible for all photographs (except those taken in colour) taken in the studio, wards, theatre, various departments, and other hospitals, and must, when the negatives are dry, deliver them with full written instructions to the printer. One senior and one junior photographer, as printers and finishers, are responsible for all work done in the processing laboratories and finishing room, except photographs in colour. One senior and one junior photographer are responsible for all colour work. The clerk's job is to make all appointments, see that patients keep them, and that the patients' instruction cards and copies of earlier photographs are delivered to the operator in good time. The clerk is also responsible for seeing that all records are filed or delivered to the departments, or, where necessary, to other hospitals.

Students.—The students, who pay an entrance fee, are given every possible help by lectures, demonstrations, and practical work in passing examinations which will qualify them for membership of the Institute of British Photographers. The advantages of the student system in hospital are the contact with doctors and nurses and the experience in handling patients. There are three qualifying examinations, and any student passing the second before the training time is up may, if he wishes, be taken on as assistant photographer and be paid a suitable salary, or he may leave to take up a position elsewhere; otherwise the course is for two years. In their first year students have a general training in hospital photography; in the second they have a choice of work and may, if they wish, concentrate on a particular branch, such as colour photography or photomicrography, etc. The subjects of lectures include optics, photographic chemistry, anatomy, colour, and general photography.

Institute of Medical Photography

An Institute of Medical Photography is urgently needed. This would be a training centre where every branch of photography would be studied and undertaken for doctors, hospitals, etc., and where patients and work would be sent. It would supply staff with mobile units wherever they were needed, also trained staff for photographic departments. It would have a special department, with membership on camera club lines, where members could meet and do their own work if they wished. Meetings would be held there providing an opportunity for photographers to meet the instrument maker, the electrician, and the mathematician and discuss the construction of suitable apparatus, instruments, and equipment. Finally, the work done at this institute would be so good that it would achieve international repute, and people from all parts of the world would come to study its methods.

MRS. BEETON AT THE HOSPITAL

Two or three years ago the King Edward's Hospital Fund for London published a memorandum on hospital meals. It was welcomed because it opened up the prospect of improvement in an important sphere of hospital work which, in some institutions, was well below standard. But it also showed how many problems there are in hospital catering, and the Fund set up a committee on hospital diet, under the chairmanship of Sir Jack Drummond, to examine them. This committee has prepared a second memorandum, based on recent experiences and observations, with the object of helping those hospital authorities who are making an effort to bring their catering arrangements up to a more satisfactory level.* The organization of the catering department in a hospital is considered at length. It is urged that catering should be regarded as a single important function of a hospital, and one which requires an experienced catering officer together with a competent staff. The most suitable person as catering officer would be a dietitian whose knowledge of nutrition and dietetics is supplemented by an adequate experience of large-scale catering, but such a person is not always easy to find, and, failing him or her, a catering officer should be appointed whose knowledge and experience have been gained in the hotel or catering trade. Such an officer should be responsible for the buying of food, control of stores, planning of menus, cooking, and service, and should report to the chief executive officer of the hosptial and through him to the governing body, or directly through a Diet and Catering Committee, formed after the fashion of the medical committee, of predominantly technical and professional composition.

The memorandum discusses the staffing of kitchens, and hints that the monotony of many hospital menus is a reflection not of restricted wartime rations but of the employment of third-rate cooks, unimaginative menu planning, and, sometimes, financial stringency. One section of this little work is devoted to

* King Edward's Hospital Fund for London. Second Memorandum on Hospital Diet. 9d. net, post free.

the value of salads and to the proper cooking of vegetables. The desirability of vegetable salads is stressed, and a number of recipes are given. The outline menus may appear almost fantastic to those who have had experience of the unexciting character of meals in some institutions. Here is a suggested menu for a full diet which can be provided under present conditions:

When Called.—Cup of tea.

Breakfast.—Porridge or cereal; breakfast dish (11 choices in a separate list); bread-and-butter/margarine; tea, coffee; marmalade once or twice a week; occasionally fresh fruit, hot rolls.

Mid-morning.—Milk; meat or yeast extract; fruit drink; cocoa.

Dinner.—Meat (occasionally fish) (10 kinds of meat or fish, each cooked and served in various forms); potatoes; cooked vegetables or salad; sweets: pudding and milk pudding as alternative. (63 choices of sweets in separate list.)

Tea.—Bread-and-butter/margarine; jam, honey, syrup, or paste or salad, cake, scones, or buns; tea.

Supper.—Cooked dish (separate list of large number of alternatives, hot or cold); sweet; bread-and-butter/margarine; milk, cocoa, etc.

This excellent pamphlet also contains examples of recipes of 13 savoury dishes, 8 sweets, and 7 pastries and sauces, each for 50 persons. It might be commended not only to hospitals and nursing homes but to canteens, hostels, and institutions of all sorts where meals are served, while most hotels might profit from a glance at it.

OCCUPATIONAL RESETTLEMENT OF THE DISABLED

CRITICISMS OF GOVERNMENT SCHEME

P E P (Political and Economic Planning) has issued a broadsheet (*Planning*, No. 238) on the Government's plans for rehabilitation and resettlement of ex-Service men. A consideration which is perhaps not appreciated as it should be is that only one-quarter of all disablement is due to direct physical injury like amputations; three-quarters is due to organic disease or to neurosis. It is easier in general for the physically injured man, after an initial period of adjustment, to settle down to normal life and work than it is for one who is suffering from chronic disease or from some psychological trauma. The problem of disablement, says P E P, will get out of focus if it is considered as wholly or mainly a question of physical injury.

The Pivot of the Scheme

There are signs, says this broadsheet, that the Government's resettlement arrangements, well thought out on paper, are yielding too high a proportion of failures. The Ministries concerned have done their best, within the limits of available personnel, to produce efficient machinery for the re-establishment of normal life, but in practice something has gone wrong. Examples are given of cases in which a man was offered or directed to unsuitable work by the disablement rehabilitation officer, and only through a welfare follow-up was the mistake eventually recognized and the man placed in a satisfactory job. The disablement rehabilitation officer is the pivot on which the Government scheme turns, but the first contact with this representative of the Ministry of Labour comes too late. The D.R.O. should be introduced at a much earlier stage of a man's stay in hospital; he should be a familiar figure about the wards, and should have more opportunity to talk to patients and thus be made better able to appraise their capabilities.

It is also said that the D.R.O. is insufficiently trained, and has inadequate knowledge of industrial work, and little understanding of the background of the men he interviews; that his approach is too casual; that he lacks initiative; that he has not had the right type of education or experience; and that he has not the skill to overcome suspicion or shyness and is not fully appreciative of the difficulties arising from medical and nursing conditions. These men are selected from the staffs of employment exchanges, where they have acquired little internal knowledge of industrial conditions and none at all of social welfare. Some of them, no doubt, are conscientious and kindly, but too many are temperamentally unsuited to the needs of the job. Many are of the same age as the young ex-Service men they interview, and that in itself creates a barrier.

P E P urges the widening of the field of recruitment of these men. Selected ex-Service men, after a certain amount of training, should be taken, also welfare workers who have been employed in dealing with the personal difficulties of working people in their social setting, and labour officers of the Ministry of Supply who, from their experience in ordnance factories, combine some understanding of industrial matters with the knack of assessing a man's capability for a particular job.

Abolition of Pensions Ministry Suggested

Another suggestion of the broadsheet is that carefully selected field officers should be appointed to Service hospitals and E.M.S. units handling long-term cases—men who would live among the patients and really get to know them and build up the necessary confidence; and the work of these officers, like that of the hospital almoners, should be followed up by social welfare workers who would regularly visit the disabled man after he had left the hospital. It is also proposed that the Ministry of Pensions should be abolished, its medical services transferred to the Ministry of Health, and its income, maintenance, and welfare functions to the Ministry of National Insurance. One Department less would mean much less chance of interdepartmental friction. There would still be three Ministries primarily concerned with the disabled ex-Service man—the Ministry of Health for medical care, the Ministry of Labour for training and resettlement, and the Ministry of National Insurance for financial support and general welfare. It is therefore suggested that these three Ministries, possibly in conjunction with the Ministry of Education and the Services Departments, should maintain an interdepartmental council to concert joint action for rehabilitation, training, and resettlement of all disabled persons, with similar joint machinery established locally, or a National Rehabilitation and Resettlement Board might be set up to exercise delegated powers, with the disablement rehabilitation officers and social workers attached to its local or regional agencies.

There is already in existence a Disabled Persons (Employment) Corporation, designed to meet the needs of those whose disability makes it impossible for them to work on equal terms with the able-bodied. Nothing can be said in criticism of it, for it has not got much further than registration as a public company, but its title seems unfortunate. "Strengthen me by sympathizing with my strength, not my weakness; find out what I can do and let me do it, and forget what I cannot do and let me forget it," was the wise slogan given by Mr. H. E. Griffiths at a recent conference on occupational readjustment. Canada has an organization, Vetcraft Industries, for veterans of the 1914–18 war. It is supported by the Government, and has Government Departments as its sole customers. From small beginnings the organization now supplies a wide range of products. This Canadian example may give an idea of how such a project should be developed.

A final suggestion is that early consideration should be given to the taking over by industrial concerns, with Government co-operation, of disused Service installations and converting them into industrial colonies for the provision of jobs and homes for disabled men, though at the same time it is pointed out that segregation of the disabled is in general undesirable and should be avoided except where there is no other choice.

The thirtieth annual report of the Committee of Management of the Royal Victoria Hospital Tuberculosis Trust has been published in Edinburgh. Several pages are devoted to the prevalence of bovine tuberculosis and existing methods of control. After reviewing the facts the conclusion is clearly stated that at the present time the public should safeguard themselves by using either one of the grades of milk guaranteed to be produced free from tuberculosis infection or the pasteurized variety. It is of the utmost importance that any other variety of milk should be brought to boiling-point before use, particularly if it is for consumption by young children. The committee feels strongly that nothing short of the complete elimination of infected bovine animals must be the ultimate aim. Until this is attained there will remain a real menace to life and health. This question therefore should have a prominent place in post-war health planning. The cost of such an effort measured against the social and economic advantage would be relatively small.

Correspondence

Small Hospitals: Efficiency and Economy

SIR,—"Hospital Survey: The Hospital Services of London and the Surrounding Area," that formidable-looking Blue Book, has by now probably been seen by all those interested in hospital work, whether layman or doctor, and it will be agreed by all that Drs. Gray and Topping have carried out their task in an impressively comprehensive manner and with an efficiency which could not be excelled. The statistical tables which form the largest portion of the book are of the greatest value to hospital organizers, and to my knowledge are in constant consultative use in most hospitals. We must all, therefore, be appreciatively grateful for the tremendous labour which the authors have put into such a Herculean work.

But, having paid tribute to "Hospital Survey," we should not let our appreciation blind us to the fact that, like many other such reports, it was produced under certain conditions and auspices which have an influence upon its recommendations. I refer to the knowledge that the survey was undertaken at the instigation of the Minister of Health in 1941 and that there must of necessity have been terms of reference. What these terms were is not quite certain; but, whether definitely stated or merely implied, it is clear from reading the report that they involved the idea of discovery whether the hospital services could be more *efficiently* and *economically* (not only in the financial sense) run. If this was indeed the real state of affairs it must be constantly borne in mind when considering the report that it had a restricted aim in view, and all its recommendations should be seen in the light of those restrictions. In other words, the report now becomes the opinion of two well-informed minds upon the possible change which would make for greater *efficiency* and *economy* of working. Such a viewpoint immediately changes one's reactions to the Blue Book, for when I regard the report as a complete survey of hospital activities I cannot escape the conviction that it is a completely soulless document; but if I think of it as an essay upon the possible changes which might lead to greater *efficiency* and *economy* then the book stands in a different category, for I am now at liberty to ask what efficiency in medical work means, and whether it is to be the be-all and end-all of medical ambition. Efficiency is difficult to define; who knows what efficiency in its medical application is? Medicine changes so rapidly that what is worshipped as efficiency to-day becomes a clay-footed idol to-morrow. When our dramatic critics say that Miss A.'s acting was efficient, what do we think? Were Turner's paintings, Shakespeare's plays, efficient? Surely we have to think of more in medicine than efficiency. Supposing the Home Secretary asked for a "Family Survey" it would be possible for an assiduous worker to produce a report the logic of which was beyond challenge, but it would of necessity have to contain such statements as: "We found that the one-child family is inefficient and uneconomic, and so we suggest that all children from such families be transferred to the larger families of four or more children." Irrefutable logic, once we accept that efficiency and economy of effort are the final aims.

This brings me to the main point of this letter, for I notice that it is proposed to turn many of the small hospitals into mere annexes of the larger, for the reception of convalescent patients and the like. The basis for this suggestion is that the small hospital is inefficient and uneconomic. I cannot agree for two reasons: in the first place, as I have tried to explain, I do not think that in matters of medical treatment we should raise efficiency to a god-like status; in the second place I do not believe that most of these small hospitals are inefficient when judged by the only criterion that matters—namely, results. It is my privilege to work in both classes of hospital, from over 1,000 beds on the one hand to 50 on the other, and I find that my results are as good in the one as in the other—this for major surgery. I am, of course, not ignorant of the fact that there are certain very highly specialized types of treatment which the small hospital is not equipped to undertake. Cases requiring such treatment, however, make up a very small percentage of the whole and can be dealt with by affiliation with a large institution.

The intangible factors connected with the small hospital—local pride and faith in the institution and so on—cannot unfortunately be estimated by statistical tables suitable for reproduction in "Hospital Survey," but they are in my opinion more important to the well-being and happiness of the patient than a lot of efficiency, which in any case is not lacking.

What the legal implications of the recommended changes are I have no means of knowing, but it is certain that in many instances the money for starting and running such small hospitals has been given specifically because they are what they are. I suppose an omnipotent Parliament can change any law, good or bad, so that this difficulty may not require consideration.

Since writing the above I have had an opportunity of reading the report of the King's Fund upon the same subject, and I note with pleasure that, with certain safeguards, its recommendations are favourable to the retention of the small and cottage hospitals, and that the authors display a keen appreciation of the human as well as the humane side of hospital work.—I am, etc.,

NORMAN C. LAKE.

Safe Milk

SIR,—This is a most important subject and affects very closely the health of our children. The American viewpoint on our milk is interesting and should be stimulating. The universally suggested remedy is pasteurization, which is, of course, very sound; incidentally it is also very expensive and adds to the retail price of the milk. Surely every household could be taught to sterilize its milk; a temperature of 60° C. would ensure against most infections, and boiling against all. A double pan would guard against overheating and so mitigate against alteration of the taste, except to a very limited extent, if that is desirable. This method is much too simple for modern ideas; everything must be complicated and expensive to have any value.

What is difficult to understand is why dried milk (superheated) is considered suitable for children but boiled milk is not. Boiling does not affect the nutritional value of the milk; the destroyed vitamins are easily replaced. It is my practice always to encourage parents to rear their children on boiled milk if breast-feeding is not possible. Those so persuaded have had no reason for regret. In one particular case people came to see the fine healthy baby reared on ordinary cow's milk. This is characteristic of the artificial mentality produced by advertisements, aided and abetted by local authority clinics all over the country, which sell their favourite brand of dried milk at 1s. 6d. instead of the ordinary retail price of 7s. 6d., possibly as a bribe (part at least of the difference in price is made up by the ratepayers). Parents are not very helpful because, as the children grow older, they are told that boiled milk is horrid and so are prejudiced in favour of unboiled milk. If not so prejudiced the children would probably acquire a taste favourable to the heated variety.

Milk is the only important food that is taken in the raw state and by the most sensitive of our people, whether children, aged, or ill, yet very little is done about it of a really practical character. I would not exempt T.T. or accredited (horrid word) milk from the blessing of boiling or its equivalent. Most working-class homes are visited by swarms of officials of all kinds who could be used to influence parents in favour of heated milk. I have repeatedly brought this viewpoint to the notice of the local health committee, but got no encouragement. If the milk was as sterile as the official mind then all would be well.—I am, etc.,

Birkenhead. D. J. GAIR JOHNSTON.

Famine Oedema: A Clinical Description

SIR,—Famine oedema was frequently seen in refugees from enemy-occupied islands in the Dodecanese. All the patients were adults, mostly over 30, and all had suffered from starvation. They had lived on green vegetables for at least three months, and the majority had actually eaten grass. Potatoes, bread, meat, and fish were available to some of the patients, but only on extremely rare occasions. Such bread as was available was black and of very poor quality.

The onset of symptoms was usually sudden, with swelling of thighs or feet, and accompanied by pain. Pain may precede the actual oedema. Unaccustomed exercise or a sudden lowering

of the patient's general condition by some cause such as infective diarrhoea may precipitate the onset. On recovery a relapse is easily caused by the same factors. Swelling of the feet is the usual presenting symptom, but a large number of patients complained of "thickening and hardening" of the thighs, which pitted on pressure. Later on, in twenty-four hours' time, the swelling of the feet was evident in these cases and the oedema of thighs had disappeared. Swelling of the hands was rarer. Pain is a frequent symptom and prevents sleep at night; tenderness on pressure is almost a constant feature. The patients all complain of weakness and debility. No skin changes were seen. In all cases the heart was normal, the urine was clear, and no history of rheumatism, scarlet fever, or nephritis was given.

Treatment, such as could be given under extremely primitive conditions, consisted of 2 ounces of canned milk, 2 tablets of vitamin C, and 3 tablets of ferrous sulphate daily, in addition to the usual refugee ration. Rest and sunbathing were advocated.

The oedema lasted a long time. The quickest recovery time was one month, and many cases show only slight improvement after three months of improved conditions and "treatment."

A lack of proteins in the diet, with consequent lowering of blood proteins, seems to be the cause of the condition. The position of the oedema appears to be due entirely to posture. This was very noticeable in patients with swelling of the thighs who had been sitting for some time, the backs of the thighs being more oedematous than the fronts. A good mixed diet is needed to dispel the symptoms, but this was not available on the island where the cases were received and seen.

I should like to thank Lieut.-Col. N. S. Turnbull, P.M.O. of the Dodecanese, for permission to publish this record.—I am, etc.,

Friends Ambulance Unit, M.E.F. RAYMOND MILLS.

REFERENCE

Rog rs and Megaw (1942). *Tropical Med cine*, p. 423.

Trilene in Midwifery

SIR,—I pointed out the possible dangers of trilene in midwifery in the *British Journal of Anaesthesia* for July, 1944. I have now administered almost 1,000 trilene anaesthetics and recorded my experiences with the first 500. Consideration of these results led me to reserve trilene for healthy subjects in whom a high degree of relaxation is not required and where the expected duration of anaesthesia is short—i.e., up to 10 minutes. I have found the complications of longer anaesthesia do not occur in these short administrations.

When planning anaesthesia in midwifery it is necessary to appreciate that the terminal stage of labour may not go according to plan, and a patient intending to be confined at home may have to be sent into hospital during labour. Trilene may have provided efficient analgesia during the early stages of labour, but may not be a satisfactory anaesthetic for final delivery, particularly if operative intervention is necessary. The lithotomy position is difficult to maintain unless the patient has been heavily premedicated, tachypnoea may be troublesome, and abdominal relaxation is not sufficient to provide good working conditions for the surgeon if Caesarean section is necessary.

In my series of cases when anaesthesia lasted longer than a few minutes, 80% showed an alteration in pulse rate with about 16% of pulse irregularities. In view of these findings, if operative intervention becomes necessary it is advisable to resort to some form of anaesthesia other than trilene. When using a standard Boyle machine without a CO_2 absorber, my own experience in changing from nitrous oxide–oxygen–trilene to nitrous oxide–oxygen–ether was that after a few minutes there was always a rise in systolic blood pressure and pulse pressure with a high incidence of bleeding during operation. These findings were also present when the patient had had only a few breaths of trilene. In the control series of anaesthetics with open ether following nitrous oxide–oxygen–trilene these complications did not rise.

There has also been an alarming series of cranial-nerve palsies and some deaths when trilene has been used in the closed-circuit machine. (Cf. (1) Humphrey and McClelland, (2) Carden (*Journal*, March 4, 1944, pp. 315 and 319).) Some of these unfortunate complications occurred with anaesthetics where no trilene was used, but the same closed-circuit machine had been employed in which trilene had been used on a previous occasion without the soda-lime being changed. Apparently a mere trace of trilene in the machine is sufficient to react with the soda-lime, producing dichloracetylene, which is poisonous and is responsible for these serious complications.

When anaesthesia has to be deepened, if nitrous oxide–oxygen–ether is employed the patient who has received trilene analgesia has sufficient trilene in her exhalations for a consideraable time after the trilene analgesia has ceased to result in (1) serious haemorrhage if the standard Boyle machine is used, or (2) the production of toxic amounts of dichloracetylene if a closed-circuit machine is employed. The latter substance, in addition to being toxic to the patient then being anaesthetized, may contaminate the soda-lime container and thus affect subsequent patients similarly.

I am in full agreement with making every possible effort to give a woman in labour as much relief from pain as is compatible with her safety. Trilene analgesia is superior to nitrous oxide–air in the proportions provided by Minnitt's apparatus. I am at a loss, however, to understand why the analgesic properties of open ether have not received more attention. My own practice is to sprinkle a few drops of ether on to about eight layers of gauze stretched over a wire mask and put it over the patient's face as soon as a pain commences. The mask is removed at the termination of a pain. The patient thus remains co-operative and is relieved from pain. When ether is given in these analgesic doses atropine is not necessary. There is no coughing, salivation, or vomiting; two to three ounces of ether will provide a woman with two to three hours of analgesia during the later stages of labour. If nembutal is also given the patient usually sleeps between her pains. Full anaesthesia can be produced at any time without a change of anaesthetic. If oxygen is available it should be given under the mask, mother and baby both benefiting. The apparatus for ether anaesthesia is simple, safe, and portable, the chief contraindication to its use being an existing respiratory tract infection.

I would not venture to give trilene to patients suffering from cardiac complications or toxaemias of pregnancy. The point I wish to make in this letter is that caution should be exercised in the choice of anaesthetic following trilene analgesia or anaesthesia. Midwives cannot be expected to be specialist anaesthetists, and the responsibility of trilene in labour should not rest on the midwife.—I am, etc.,

Wakefield. EMILY E. JOHNSON.

Women in Labour

SIR,—The correspondence on women in labour leads, I think, to the following conclusions.

(1) That the vast majority of women desire more adequate relief of pain in labour than they obtain at present.

(2) That while every encouragement should be given to techniques—such as that of Dr. Dick Read—which endeavour to make labour relatively easy and painless by the careful application of physiological principles, it appears that most civilized women require some form of analgesia or anaesthesia.

(3) That in our present state of knowledge analgesic drugs for the first stage of labour and a simple inhalation technique for the second stage are the most efficient and generally applicable means of relieving pain.

(4) Several ingenious and very useful "self-help" analgesia machines are available, but they have the following disadvantages: (*a*) They do not give adequate relief to the "resistant" patient in the later stages of labour; this also applies to the very nervous type of woman who is too distraught to manage the machine herself. (*b*) They cannot be used for even simple operative midwifery, such as the application of "low forceps," so that usually in these cases a less desirable agent such as chloroform has to be used. (*c*) To maintain these machines in good working order the services of individuals skilled in the handling and maintenance of anaesthetic machines are required.

(5) With the best will in the world the present medical personnel could not devote the necessary time to give adequate anaesthesia to between 600,000 and 700,000 women a year.

What solution of these difficulties can we offer which can be put into operation reasonably soon? It can be said that the ideal analgesic drug for the first stage of labour remains to be discovered. However, from the big choice now in use most cases can be given considerable help during the first stage. A fair proportion of women can obtain good relief during the second stage by the use of "self-help" machines, provided these are kept in working order, and the woman trained in their use before labour begins.

There remains, however, a large proportion of women who will get adequate relief only during the last part of the second stage when given a well-conducted intermittent anaesthesia by a trained anaesthetist. The presence of such a person with a suitable machine is also required when that "little extra" is necessary for operative midwifery. If it is agreed that medical men cannot be spared for this work then a corps of trained medical auxiliary anaesthetists could be formed quite quickly. These auxiliary anaesthetists would work under the conditions set out by Dr. S. Wray (June 30, p. 924), and under the supervision of the medical man in charge of the case. They could work in maternity hospitals and with general practitioners in domestic midwifery. The general practitioner is very conscious of the fact that he cannot spend hours with his midwifery cases administering anaesthesia.

I feel that only on the above lines can the problem of the woman in labour be seriously tackled.—I am, etc.,

Harrogate. JAMES CAMPBELL.

SIR,—Dr. R. A. Hingson (Aug. 11, p. 196) quotes Grantly Dick Read's book *Revelation of Childbirth*, and says that he considers "caudal analgesia is a *natural* step [my italics] along the road towards the conquest of pain," presumably as one point at which the vicious circle described by Dr. Dick Read may be broken. I maintain that the ability to achieve natural childbirth *by her own efforts*, guided, where necessary, by the doctor, is of far greater help to a woman's sense of fulfilment than is the achievement of it by artificial methods. Surely the "leave-it-to-us, you-will-never-feel-any-pain" attitude towards an often tough but physiological high-spot of womanly experience is a very negative approach compared with the positive approach of the woman trained ante-natally in self-discipline and optimistic anticipation of a perfectly natural labour.

There is plenty of research in the easing of pain by various drug techniques (let us excel in their use and exhibit them freely when required), but far too little on the psychological, endocrine, and "even metaphysical"—to quote Dick Read again—aspects of the problem. A large part of the trouble is the ante-natal time required to be given to the psychological approach in particular: it is so much easier to wait till labour starts and then administer drugs. But those who will make time will be amply rewarded, and I believe the reduction in inertias and post-partum haemorrhages especially would be quite remarkable. Incidentally, I think confinements should be conducted ideally in small institutional units; the large maternity hospital unit militates against personal self-confidence, except, of course, where frank abnormalities are anticipated.—I am, etc.,

Leeds. J. GORDON HUNT.

Rehabilitation of Fractured Limbs

SIR,—I am continually exercised in my mind as to the putting of fractures into plaster, leaving the soft tissues immobile for several weeks. Why can't the plasters be cut in two by Gigli thread saws and then secured by webbing straps? This was practised at Bart's 35 years ago. The soft parts can then be got at and kept alive as advocated by Meynell. The modern method seems to me to be distinctly retrograde and entails weeks of convalescing after union.—I am, etc.,

Stone, Staffordshire. R. MURRAY BARROW.

Accidental Infant Suffocation

SIR,—Dr. W. H. Davison (Aug. 25, p. 251) pleads for the routine performance of a post-mortem examination in a particular type of case—suspected asphyxia in infancy. Few will cavil at his thesis; many will look far beyond it and urge the more frequent use of this method of investigation over the whole field of medicine. Apart from the demands of scientific accuracy, morbid anatomy has still its conquests to make, and both are served by the widespread adoption of this procedure.

Further, the coroner for the City of Birmingham refers in passing to fatal infant asphyxia from inspiration of vomit, and finds that "the circumstances of how and when the child was fed did not seem to have any direct bearing on the death." My investigation of a larger series of cases does not confirm this; possibly because the technique of infant feeding varies in different parts of the country. I have frequently found this type of asphyxia directly associated with the common and dangerous practice of giving the infant, lying hungry in the cot, a full bottle of milk. Sometimes, if needs be, the bottle is supported on the pillow beside the infant. Rapid distension of the tiny stomach is followed by regurgitation into the pharynx, and a reflex inspiration results in the infant being "drowned" in its own vomit. The mechanism is precisely the same as that which occurs occasionally in cases of acute intestinal obstruction in adults during laparotomy, when the precaution of a preliminary washing out of the stomach or the insertion of a Ryle tube has not been observed. In either case mechanical obstruction by vomitus is the immediate cause of death—a fact which is readily established by post-mortem examination.—I am, etc.,

Coroner's Office, South-East Lancashire. F. G. RALPHS.

Chronic Regional Ileitis

SIR,—Chronic regional ileitis appears to be of sufficient rarity to warrant report of a case.

A married woman aged 30 had no previous history of any note until the onset of the present trouble four years ago. The first symptom noticed was pain, situated in the umbilical region, coming on in attacks, which occurred chiefly during the night, at intervals of several months. The abdomen felt to be swollen during the attacks, which were accompanied by a sensation of soreness in the right iliac fossa. Twelve months ago the attacks became more frequent, coming on every three months. The patient became pregnant in November, 1943, and was admitted to Reedyford Hospital in one of her attacks in April, 1944. This attack was accompanied by the vomiting of coffee-ground material, which relieved the pain; as had happened in the few attacks immediately preceding, the pain was in the umbilical region, but the tenderness was in the right iliac fossa, and the condition cleared up in two weeks. The diagnosis of subacute appendicitis was made, but in view of the pregnancy intervention was avoided. The patient gave birth to an imperfectly developed stillborn child in Colne Maternity Hospital in July, 1944, and had another of her usual "attacks" in September, 1944. Between the attacks, appetite, which was lost during them, was good. There was no constipation prior to July, 1944, but it was present from then on. There was no headache or loss of weight. The patient could tell the approach of an attack by "feeling she was filling up." The final attack started on Jan. 1, 1945, and there was soreness in the right iliac fossa till the patient was seen on Feb. 6. She had noticed some loss of weight in the previous two months, and had been more constipated. She complained of loss of appetite since the commencement of the attack, and felt swollen; she had also heard "rumbling noises in her stomach." This last attack was unaccompanied by vomiting. On examination the patient was found to be a well-nourished woman with no obvious loss of weight. The abdomen was not obviously swollen and no abnormal mass could be felt. The only definite sign of abnormality that could be elicited was tenderness on passing over McBurney's point. A provisional diagnosis of appendicitis (subacute) was made, and on Feb. 7 the patient was admitted to Reedyford Hospital.

At operation a typical salmon-pink sausage-shaped swelling, 10 in. long, extending proximally from about 2 in. from the ileo-caecal junction, was seen. The ileum was dilated to about twice its diameter for about 30 in. The mass at the centre appeared quite solid. Sixteen inches of the lower ileum, including the swelling, were excised and the apparently unaffected distal portion of the ileum was sutured end to end to the proximal part; the appendix was removed; a small drain was inserted; and apart from a small sinus which persisted for a fortnight progress was uneventful and the patient now appears quite well.

Radiologist's Report.—"Mass of granulation tissue filling lumen of bowels to the extent of apparently complete obstruction."

F. G. Ralph (*Brit. J. Surg.*, 1938, **25**, 524) comes to the conclusion that "the inflammatory mass is the response of the tissues to a slow infection of low virulence." However that may be, the disease appears to be a new one and on the increase. Dr. Whittle, of Nelson, makes the remark that if the disease is new it must be due to a vitamin or other dietary deficiency. In this part of the world shortage of vitamin C appears most likely. Recently one of us has seen a case which *may* have been acute regional ileitis. The patient was a very spare female, aged 60, with extraordinarily lax abdominal walls; onset, acute pyrexia and vomiting; sausage-shaped mass palpable, extending from right iliac fossa to pelvis in midline; complete recovery within a week on a diet of 12 oranges a day; only after the fourth day did traces of vitamin C appear in the urine, but she also had sulphamezathine in adequate doses.—We are, etc.,

O. WILSON.

Nelson, Lancs. T. D. CULBERT.

Air Embolism

SIR,—Reading through the interesting account of two cases of air embolism by Dr. P. H. Dalgleish (Aug. 25, p. 256), I think that the attention of any tuberculosis worker would be at once arrested by the statement: "A little air, less than 50 c.cm., *was blown through* to clear the needle." I do not think that such a procedure would have been considered proper at the majority of clinics or sanatoria. The most probable procedure on getting a dubious manometer reading would have been the removal of the needle and its reinsertion at another site.

In the final paragraph of Dr. Dalgleish's article he says: "These cases emphasize the points made by Hamilton and Rothstein (1935): that the *common practice* of 'blowing a little air through the needle to clear it' is one not unaccompanied by danger, and is in fact to be firmly discouraged." In face of this warning it seems strange that it should have been disregarded.—I am, etc.,

Southborough, Tunbridge Wells. E. WEATHERHEAD.

Syphilitic Reinfection after Penicillin Therapy

SIR,—The following case record illustrates the curative effect of penicillin therapy in primary syphilis inasmuch as the patient, after being treated with penicillin for a primary chancre, returned to this unit in a short space of two months with a second primary sore.

A young African (aged 22) was admitted to the treatment centre where we are serving on March 5, 1945, with a primary chancre of the peno-scrotal junction on the right side. This was a typical indurated sore, and the dark-ground microscopy revealed the *Treponema pallidum* in the serum of the sore. The Kahn test was negative. A course of 2,400,000 units of penicillin was given (40,000 units intramuscularly every three hours for 7½ days). The patient was discharged on March 21 with the sore completely healed.

On May 29 the same patient was readmitted to this centre. He now had an indurated sore of the shaft of the penis, on the left side, with all the characteristics of a primary syphilitic chancre. The dark-ground microscopy revealed the presence of the *Treponema pallidum* in the sore. The Kahn test was − + 1, one plus (weak positive) on May 30. The scar of the old sore was both visible and palpable, and quite separate from the new sore.

Our thanks are due to Brig. R. P. Cormack, D.D.M.S., for permission to publish this observation.—We are, etc.,

K. B. WOOD, Capt., R.A.M.C.
G. C. COCHRANE, Capt., R.A.M.C.

East Africa Command.

"Under the Influence"

SIR,—The attention drawn by Dr. C. E. Meryon (Aug. 18, p. 234) to the increasing legal difficulty of obtaining a conviction for dangerous driving under the influence of alcohol indicates that the time may have come for the medical profession to suggest that the law be altered. In addition to the type of case he quotes, in which legal skill is able to exonerate a driver who was obviously intoxicated at the time of examination, there is another still more difficult to convict. Laboratory experience on the effects of small doses of alcohol rapidly absorbed demonstrates quite clearly that it is possible for a driver to be involved in an accident because he is under the influence of alcohol and yet be completely sober 15 to 20 minutes later when tested at the police station and, incidentally, show a blood alcohol concentration regarded as non-intoxicating; the disturbance of cerebral function occasioned by a relatively low concentration, if this is increasing rapidly, disappears when the peak has been passed.

On the other hand, a driver may be in an advanced stage of apparent inebriation when seen at the police station, and although this is the obvious cause of the accident in question, he will be acquitted if the effect is not due to alcohol. A glaring example of this legal anomaly was recently reported in the lay press: following the accident the driver was found in a semi-comatose condition, but because this was due to insulin he was acquitted by the magistrate.

If the purpose of the law is to protect the public against dangerous driving, the action of the driver is surely of greater importance than the possible causes of his action. Dangerous driving should itself be the serious offence. Legal discussion as to the meaning of dangerous driving could be no more involved than that occasioned by the existing law to which your correspondent has drawn attention, and medical men would be free to spend their available time in work of greater social importance.—I am, etc.,

London, W.C.1. M. GRACE EGGLETON.

? Abuse of Sulphathiazole

SIR,—I have read with interest Dr. P. Robinson's paper on "Penicillin for Haemolytic Streptococcal Throat Infections" (Aug. 18, p. 213), and observe that this has given satisfactory results where sulphathiazole has in many cases failed either to cure the condition or to prevent complications such as peritonsillar abscess, erythema nodosum, and acute rheumatism. On reading the case notes I have, however, been asking myself why this sulphonamide preparation has been chosen and not the ordinary sulphanilamide.

Since the discovery of the various preparations of the sulphonamide group I have carefully studied articles on their action and indications in the *B.M.J.*, and was given to understand that the original sulphanilamide proved most effective in streptococcal and *B. coli* infections, that sulphapyridine was most useful in pneumococcal infections, and sulphathiazole in infections with staphylococci, meningococci, and gonococci—to mention the chief indications. I have also learnt that the toxicity increases from sulphanilamide via sulphapyridine to sulphathiazole, resulting in severe sickness, kidney damage, agranulocytosis, etc.

One of my patients, a baby, has been treated in hospital with sulphathiazole for pneumonia which was not proved to be staphylococcal—it was most probably the usual pneumococcal type. No overdose was given, but the baby developed a nephritis which has become chronic. I asked myself if the same would have happened with sulphapyridine, which I usually give with excellent results.

I have heard of patients complaining of extreme nausea and sickness when receiving sulphapyridine for tonsillitis. I have treated for years now all cases of tonsillitis and tonsillar abscess—which are mostly streptococcal in origin—with the original sulphanilamide, and have always obtained good results without observing either toxic symptoms or complications, provided treatment was instituted in good time. Ordinary pneumonia I have treated with sulphapyridine and found this entirely effective. Only cases with proved staphylococcal or doubtful other infection I treated with sulphathiazole, and was again extremely satisfied with results. Since infectious fever and V.D. cases are usually treated in special centres I had not much opportunity for using sulphonamides on these.

I want to put these observations on record to show that with careful choice sulphonamides are usually adequate in treating most infectious conditions and only seldom—e.g., in osteomyelitis—is penicillin required. If I am mistaken I should be most grateful if an authority on the subject would correct me.—I am, etc.,

Spennymoor, Co. Durham. E. BRAUER.

March Fracture

SIR,—I have just read the letter from Sir Lenthal Cheatle (July 28, p. 134) under the above title, and I feel that, having been regimental medical officer to a battalion of His Majesty's Brigade of Guards for a number of years, I am in a position to answer his question as to what the medical officers are doing about "this ugly, ridiculous ritual" of the stamping of feet on drill parade, which is so integral a part of the Brigade particularly. I pointed out to the adjutant and to the regimental sergeant-major of the battalion the opening passages of *Foot Drill, All Arms*, which state that noisy stamping of the feet is strictly forbidden. I was at that time seeing a considerable number of guardsmen who were suffering disability as a result, in my opinion, of this ritual. The adjutant's response was that he could see no reason why I should be any more successful than generations of medical officers before me who had tried to get this instruction enforced, and the sergeant-major denied that any stamping of the feet was being practised, saying that the men merely "put their feet smartly to the ground." The A.D.M.S. appeared to be powerless in the matter, so there it rested.

Thus the answer to Sir Lenthal would seem to be, "Nothing, because there is nothing to be done." For obvious reasons, I must regretfully remain,

"PEDES PLANI DOLENTESQUE."

Whooping-cough Vaccination

SIR,—With regard to the article on whooping-cough vaccination by Drs. A. M. McFarlan, Elizabeth Topley, and May Fisher (Aug. 18, p. 205) perhaps the results in a general practice scattered over a wide area, including a large town and a number of villages, may be of interest.

In the last six years I have done over 300 children, 95% of them at the age of 12 months, and 95% of them with a combined diphtheria and whooping-cough vaccine. So far there has not been a single case of whooping-cough (or diphtheria for that matter) among the cases, although the majority of the children have been living in districts where epidemics have occurred. We have had a mild whooping-cough epidemic each year for the past six years.

The parents of a child living in a village four miles from here, whom I vaccinated three years ago at the age of 1 year, informed me only yesterday that her boy and another, whom I vaccinated about the same time, living in the same street, were almost the only two children who did not require to stay away from the village school during a recent whooping-cough epidemic. These numbers may be too small to form any real decision, and some of the children may have been naturally immune, but I feel that the results warrant me to continue the practice.—I am, etc.,

Leicester. A. MORRICK.

Climate and Health

SIR,—Dr. Macdonald Critchley's Croonian Lectures on "Problems of Naval Warfare under Climatic Extremes," published in your issues of Aug. 4, 11, and 18, contain conclusions that are open to question. In a paper, "Health and Climate," published in the *Malayan Medical Journal* for December, 1932, I pointed out that (1) man can live in any part of the world where he can obtain food and water, but (2) he enjoys health and energy, physical and mental, leading to the highest state of civilization only in certain regions with an optimum climate (Western Europe, South-East Canada, and Eastern and Central U.S.A.); and (3) though he can colonize a tropical country, his children there, at any rate, will suffer physical and mental deterioration. As an example of physical deterioration, even in the first settlers, there is presbyopia, which comes on many years earlier among tropical peoples and among whites who have lived long in the Tropics than it does among the inhabitants of an optimum climate.—I am, etc.,

London, S.W.1. KENNETH BLACK.

Methodology in the Curriculum

SIR,—I should like to express my agreement with the general argument in the article on premedical zoology by M. Abercrombie and M. L. Johnson (Aug. 25, p. 262) and my particular support for their plea for the deliberate teaching of scientific method to students. As long ago as 1932, in the discussion in your columns on medical education initiated by an article by Dr. C. M. Wilson (now Lord Moran), I suggested the same thing—the addition of the subject of methodology to the curriculum. I said then: "The student should be given the opportunity of becoming acquainted with and developing the rational attitude of mind. He should be encouraged in the attitude of intelligent scepticism as distinct from that of constant acquiescence in dogmatic teaching. He should be made aware of the necessity of distinguishing between assertion and proof, between a reason and a rationalization, and should be helped towards acquiring some knowledge of the personal bias." I would add now that this should include the set teaching of the correct principles of reasoning, otherwise logic, but not, under any circumstances, the traditional system.

The further point that follows again needs accentuation. The addition of another subject to the curriculum, combined with the constant increase in medical knowledge, must lead inevitably, as I pointed out in the same correspondence, to further specialization. The student will be compelled before qualification to drop certain subjects and "specialize" in the rest. I see no escape from this position, and suggest it would be wise to prepare for it and begin to work out its medical and social implications.—I am, etc.,

London, W.1. FREDERICK DILLON.

Premedical Zoology

SIR,—The paper on this subject in your issue of Aug. 25 is convincing and long overdue.

As I remember, my medical zoology course was largely confined to protozoa, earthworms, and the dogfish, while the science course was devoted entirely to snails. I did acquire some understanding of the common heritage of all vertebrates—the notochord, primitive streak, cranial nerves, etc.—but also a great deal of useless mental lumber which I proceeded to forget as soon as possible. Long after qualifying I acquired the *Beast Book for the Pocket* by Edmund Sanders, and I am sure I learned more from it than from my university course. This, I should say, is the sort of textbook for future doctors, and it can be read with interest and profit by a schoolboy. If, as I believe, a good doctor should be a naturalist and know something about most living things and their mutually dependent ways of living, I suggest dogfish have had their day and pigs, sheep, and horses might be considered instead, or even rabbits.

My own university was no worse than any other, I am sure. Therefore I would like to sign this letter merely,—Yours, etc.,

"M.D., B.Sc."

Doctors and the Social Trend

SIR,—As I sat through the last Annual Representative Meeting I wondered how the B.M.A. could possibly have chosen such a time for its deliberations. Surely it was political ineptitude to continue as if the caretaker was bound to be the new landlord. I wondered, too, how those of us who voted for the Labour Party could help to avoid the complete break-up of the Association if a Labour Government came to power with a clear mandate for new health services. For throughout both of the last two Representative Meetings there seemed to be a tacit agreement to ignore the results of the B.M.A.'s own questionary—results which showed that a majority of medical men would in all probability accept service under a National Health Service planned on the lines of the White Paper. When the Election results became unmistakable the suggestion arose that we must therefore close our ranks. Certainly, but do we close them for work with the people, or against them? Dr. J. Shackleton Bailey (Aug. 18, p. 235) has shown us the way out in one of the most constructive and understanding letters that has appeared in our *Journal*.

The Government has now a clear mandate to put into action the Labour Party's policy on a National Health Service. Our Association has objected in the past that changes in the health services should be preceded by such improvements in living and working conditions, in housing, and in nutrition that must eventually reduce the incidence of disease in the best way. The new Government is entirely in agreement that this approach is correct, and consequently housing and social security are among its first intentions. But this, as regards health, is long-term policy and sickness rates will not decrease immediately, so that reform of our curative health services cannot be postponed.

In its negotiations with the Ministry of Health the B.M.A. has shown itself capable of constructive policy. For example, it induced the Minister to accept the proposal that reform of the mental health services should be part of the new National Health Service. We can, however, go much further, and with a willing Government show the Ministry of Health how to design a new health service so that industrial, maternity, and mental services can all be integrated with the hospitals and health centres; not, indeed, that all these should be at once incorporated, but that the scheme should be so designed that all these services can be operated by the same administrative machinery as and when sufficient trained personnel become available.

We have nothing to lose by co-operating constructively with the Government. The Association's miserable attempts to

save private practice by a scheme to finance the purchase of practices has been exposed by Dr. Robert Poots (*Supplement*, Aug. 11, p. 43), and it can lead to nothing but a lower standard of life for general practitioners. I need not repeat his arguments, but any demobilized doctor would be wise to study Dr. Poots's analysis of the figures before becoming the servant of the banks rather than assuming the more dignified position of a servant of the people.

My years in the E.M.S. have taught me the pleasure of whole-time medical service. I have been equally frustrated by the administration in local authority hospitals and in voluntary hospitals. But in the former the particular local authority concerned, after many misunderstandings and a tough struggle, now prides itself on its medical and staff committees and on its increasing decentralization of control. A Labour Government must encourage democratic methods, and we must, therefore, seize the opportunity to show it how best to organize the services so that all health workers, nurses, medical auxiliaries, and others as well as doctors can best influence and guide the development of the new service. We must, too, give up talking about health centres as if they are something too difficult to design without prolonged experiments, thereby betraying ourselves as incapable fools without the wit to plan the next step forward.

The B.M.A. must now choose between two alternatives. On the one hand, obstructive tactics and the opposition of private to public interests can only lead to loss of respect by the public for the profession, and to the collapse of our professional organization. On the other hand, tempered criticism, constructive assistance, and an understanding of inevitable social trends will lead not only to a rehabilitation of the profession but to a development of health services which will put the whole of modern medical science at the disposal of the people. Dr. Shackleton Bailey has given us a clear lead.—I am, etc.,

Wimbledon, S.W.20. HUGH GAINSBOROUGH.

SIR,—It is a pleasure to read Dr. J. Shackleton Bailey's letter and a pity that such clear thinking is not more common. As he says, the world is undergoing a great upheaval and what is wanted is a change of attitude of mind. The *raison d'être* of the medical profession is the maintenance of the health of the community. Ill-health was not sent by a beneficent being for exploitation by a professional class, and, provided the State grants its practitioners a reasonable remuneration, the removal of the monetary value of individual patients might prove of moral value in itself.

The profession would have been better advised if, in its dealings with the Government, it had adopted a spirit of willing co-operation in evolving the best possible system rather than one of resistance to an inevitable and probably beneficial change.—I am, etc.,

Wanstead Park. M. STARK.

Day Nurseries

SIR,—Dr. F. Gray (Aug. 25, p. 267) finds my statements fantastic, and therefore I ask to be allowed to say that the pre-war day nursery which I described, and of which I had an intimate knowledge, accepted between 40 and 50 children daily. In each case the father came under one of the headings quoted in my previous letter. In each case "the home" consisted of one or two "let-off" rooms. I gladly agree with Dr. Gray that such cases are a minority, but they do exist and must be helped.

But what about the majority—i.e., the man and wife: he in his job, and she occupied with her house duties? I suggest that if the scope of the day nursery were extended also to provide part-time service for them according to their individual needs and circumstances they would thereby be stimulated, encouraged, and assisted to add to the population. In addition, the valuable contribution that a well-managed day nursery can make towards hygiene, education, and social behaviour of the child in its most formative years must not be overlooked.

Dr. Gray and I are on common ground in deploring the fact that the young mother with a child should go out to work, and be underpaid into the bargain, but I think he is mistaken in laying the blame at the door of the nursery. Such a line of thought could lead us to accuse the hospitals and health clinics of promoting disease.—I am, etc.,

London, N.W.11. L. S. WOOLF.

Catalogue of Medical Films

SIR,—A catalogue of all the medical films in Great Britain is now being prepared by the Royal Society of Medicine in co-operation with the Scientific Film Association. It would be appreciated if any persons holding films of medical or paramedical interest, who have not already been asked for details, would communicate with the Film Cataloguer, Royal Society of Medicine, 1, Wimpole Street, W.1. By so doing they would not commit themselves or their films, but would enable the catalogue to be complete.—We are, etc.,

GORDON GORDON-TAYLOR, President, Royal Society of Medicine.

ARTHUR ELTON, President, Scientific Film Association.

The Services

It has been announced by the War Office that the release of medical officers will be proceeded with up to Group 23 by Jan. 20, 1946, in step with the rest of the Army.

The Central Medical War Committee is informed that the rate of release of medical officers from the Royal Air Force has been accelerated. The following age and service groups will be released by the dates shown: By Oct. 31, Groups 13 and 14 (i.e., additional to Groups 11 and 12); by Nov. 30, Groups 15 and 16; by Dec. 31, Groups 17 and 18; by Jan. 31, 1946, Group 19; by Feb. 28, 1946, Group 20.

Lieut.-Gen. Sir Alexander Hood, K.C.B., C.B.E., M.D., F.R.C.P., late R.A.M.C., Director-General of Army Medical Services, on completion of tenure of appointment is retained on the Active List (supernumerary).

Major-Gen. S. R. Burston, C.B., C.B.E., D.S.O., E.D., A.A.M.C., has been appointed Honorary Physician to the King, *vice* Brig. D. M. McWhae, C.M.G., C.B.E., V.D., A.A.M.C., who has resigned the appointment.

Temp. Surg. Lieut. Arthur Morton Evans, R.N.V.R., has been awarded the D.S.C. for bravery, determination, and devotion to duty in an action with shore batteries off Andaman Island on March 19, 1945, and in successful attacks on enemy submarine chasers and merchantmen on March 26, 1945.

Capt. Robert Barer, R.A.M.C., has been awarded the M.C. in recognition of gallant and distinguished services in North-West Europe.

Lieut.-Col. (Acting) A. D. MacPherson, R.C.A.M.C., has been awarded the D.S.O. in recognition of gallant and distinguished services in North-West Europe.

Major J. A. Wright, R.C.A.M.C., has been mentioned in dispatches in recognition of gallant and distinguished services in North-West Europe.

2nd Lieut. Harbans Singh, I.A.M.C., has been awarded the M.C. in recognition of gallant and distinguished services in Italy.

The King has conferred the Efficiency Decoration upon the following medical officers of the Territorial Army: Lieut.-Col. G. T. Hankey; Majors (Temp. Lieut.-Cols.) H. W. Bambridge, R. E. M. Fawcett, E. Hutcheon, F. L. Ker, P. J. May, M.B.E., and D. N. Nicholson; and Majors R. V. Facey, H. V. Ingram, and D. P. MacIver, M.C., R.A.M.C.(T.A.).

CASUALTIES IN THE MEDICAL SERVICES

Flight Lieut. SAMUEL LLOYD JONES died on July 29 while on sick leave after being invalided from over-seas. He was born on Feb. 9, 1913, and studied at the Welsh National School of Medicine, qualifying M.R.C.S., L.R.C.P. in 1940. After holding appointments at Swansea General Hospital and as assistant medical officer of health, Merthyr Tydfil, he received a commission as flying officer in the R.A.F.V.R. on Oct. 17, 1941.

Killed.—War Subs. Capts. Alexander Brown and David Frew Wood, R.A.M.C.

Died abroad, as the result of an accident.—Surg. Lieut. Angus Charles Macrae-Gibson, R.N.V.R.

Died in India.—Major Alfred Charles Greene, I.M.S.; Capt. Jean Cunison Nelson, R.A.M.C.

Died in Bermuda.—War Subs. Capt. John Michael Hamer, R.A.M.C.

Died.—Lieut. Gerard Baum, R.A.M.C.

Wounded.—War Subs. Capt. S. Hyman, R.A.M.C.

Obituary

ERIC BIDDLE, *M.C.*, M.B., B.S.

We regret to announce that Dr. Eric Biddle, pathologist and transfusion officer at the East Suffolk and Ipswich Hospital, died on Aug. 21 as the result of a motor accident. He had been chairman of the East Suffolk Division of the B.M.A. in 1939–40 and was elected president of the Suffolk Branch last year. A student of Guy's Hospital, he qualified M.R.C.S., L.R.C.P. in 1915 and after service in the last war as major, R.A.M.C., during which he won the Military Cross and bar, he took the M.B., B.S.Lond. in 1922. At Guy's Eric Biddle held appointments as house-surgeon, out-patient surgical assistant, and senior assistant bacteriologist. He was later assistant in the venereal disease department of the Royal London Ophthalmic Hospital and pathologist to the Devonshire Hospital, Buxton. He joined the B.M.A. in 1926 and was a member of the Pathological Society and the Association of Clinical Pathologists. He published a report on the bacteriological investigation of arthritis in the *Journal of Clinical Research*, and contributed to the *British Medical Journal* in 1939, jointly with Mr. G. F. Langley, a paper on transfusion with conserved blood. His last published writing was a letter in these columns on May 26 of this year in which he put pertinent questions on the subject of blood donors and transfusion services under post-war conditions. In common with many other transfusion officers he was faced with a transition period in which drastic and serious fall in the number of donors must be expected and a resignation of many of the voluntary staff who had helped him during the war.

A. R. H. writes:

The tragic and sudden death of Eric Biddle has come as a shock to his many medical and lay friends in Ipswich and East Suffolk. He came to us from Guy's, where he was senior assistant bacteriologist. As pathologist to the East Suffolk and Ipswich Hospital, he had been in charge of the laboratory since his appointment in 1927 as its first director. In 1928 the new pathological laboratory was officially opened in Ipswich by the Princess Royal, and from then until now, under his able direction, it has grown both in the scope of its work and in its usefulness to the hospital and the area which it serves. During the war years the work of the department became more and more exacting. Dr. Biddle organized a most efficient blood transfusion service which he built up from small beginnings before the war. Latterly he had as many as 172 donors at one session, and averaged 100 donors at each fortnightly session. All this he did and much more outside the terms of his appointment, and always cheerfully and ungrudgingly. He undertook research in penicillin, and his interest in the forensic side of medicine resulted in his services being sought by the authorities to find the cause of death in obscure or suspicious circumstances. He was medical officer to the 9th Suffolk Home Guard and carried out his duties with characteristic enthusiasm. A keen photographer, he was an active member of the Ipswich Photographic Society, and would always help a colleague with photographic evidence for publication or for filing with clinical data. The Music Club for Nurses, which has afforded much entertainment and recreation to the nursing and resident staff, was founded by him. His keen sense of humour and ready wit—free from cynicism or invective—were a joy to us all. Those of us who knew him as a friend and colleague feel the loss of a genial and kindly personality who was always eager to render service at any time and in any emergency.

A. P. BACHA, M.B., B.S., F.R.C.S.

India has lost a pioneer surgeon by the death of Dr. Ardeshir Pestonji Bacha on May 5. He was born in 1881 at Navsari, a town near Bombay in the Baroda State Territory. He passed the matriculation examination from the local high-school and joined the Grant Medical College in Bombay in 1898, where he passed all his examinations in the first class and won scholarships, prizes, and medals. He graduated from the Bombay University in 1903. After working for a short time as a house-surgeon in Dr. Masina's private hospital he secured the Tata Scholarship for further studies and joined University College, London, where he passed the M.B., B.S.Lond. in 1907 and F.R.C.S.Eng. in 1909. He returned to India early in 1910. At that time the Grant Medical College and the Jamsetjee Jeejeebhoy group of hospitals were the only teaching institutions in medicine in Bombay, and they were entirely staffed by I.M.S. officers. At about the beginning of the century Dr. H. M. Masina, F.R.C.S., had started a private hospital, the first of its kind in Bombay. In 1910 Dr. Bacha started a modern nursing home, and by dint of sheer merit he gradually built up a good surgical practice. Since then Bombay has got the new G.S. Medical College, with the K.E.M. Hospital attached to it, the Jerbai Wadia Hospital for Children, the Tata Memorial Hospital for Cancer, and many other hospitals, all staffed by capable Indian medical men and women.

J. B. D. writes:

Dr. Bacha was a keen student of contemporary medical and surgical literature. He subscribed to the leading British and American medical journals and read them carefully. He also bought all the best books published during the last thirty-five years, and the collection in his splendid library had cost him a very large sum. He was also equally lavish in the acquisition of the best appliances and instruments for his work, the latter being also of great value. He took great pains over the minutest details of operations and the after-care of his patients, and thus built up a thoroughly well deserved reputation as a most careful and successful surgeon. Throughout his life he remained a close student of the latest developments in the field of general surgery. He was a staunch Indian Nationalist, though during the later period of his life he greatly deplored the disruptive and communal tendencies in the Nationalist movement which have developed later. During this war he gave his services to the war-wounded as a lieut.-colonel, I.A.M.C., till he was incapacitated by his last illness, and for these he was thanked by Col. Sir Jamshedji N. Duggan, I.A.M.C., the head of the war hospital in Bombay. He was a member of the British Medical Association for over forty years, and a past-president of the Bombay Medical Union. He was surgeon to the Parsi General Hospital and surgeon and lecturer in surgery to the King Edward Memorial Hospital. He was an examiner in surgery for the M.B., B.S., and the M.S. degrees of the Bombay University. He cherished the highest ideals of our profession, and was very strict and uncompromising in his observance of those ideals. I had the privilege of an unbroken intimate friendship with him for fifty years. He was a pioneer Indian surgeon who has set a very high standard for others to follow—one who would have been acclaimed as an outstanding surgeon in any country.

ALFRED SALTER, M.D.

Dr. Alfred Salter, who died in Guy's Hospital on Aug. 24, at the age of 72, first entered the House of Commons as Labour member for West Bermondsey in 1922. He lost his seat in the following year, but regained it in 1924, and held it until his retirement at the recent dissolution. His political activities overshadowed his achievements in medicine, which in his earlier years gave promise of a brilliant career. He was a Guy's man, qualifying in 1895, when he took the gold medal in medicine and triple first-class honours in the London M.B., and in the following year he proceeded M.D., again with gold medal. In 1897 he won the Golding Bird gold medal and scholarship in public health and the Gull research scholarship in pathology. After holding an appointment as house-physician and resident obstetrician at Guy's he became bacteriologist to the Lister Institute of Preventive Medicine, where he remained for three years, and contributed many papers on bacteriological and pathological subjects to French and German as well as English periodicals. His ardent sympathy for and championship of the poor led him into general practice in a working-class district, and he became the senior member of a large partnership in Bermondsey, where he was a well-known figure going on his rounds on a tall bicycle and wearing even in those days the flaming Socialist tie. The woeful condition of the people in some parts of London even as late as the early years of this century caused him to take up various forms of social and religious philanthropy—he would give an address in a little mission hall on a Sunday evening, and then rush off to perform a minor operation, afterwards going on to his adult school or his lads' club—and to become a member of his borough council (of which he was an alderman at the time of his death), of the County Council, and of Parliament.

A correspondent who had known Dr. Salter for over forty years writes:

He was one of those rare spirits who combine the pacifist approach in public affairs with an extreme militancy in propaganda. He was a "bonny fighter," and never feared to cause dismay in the ranks of his friends by his extreme views and forthright utterance. Had he been more accommodating in his conscience he might have won

a higher place in politics; as it was, he remained a back bencher while men in his own party far less richly endowed than he, whether in intellect or in moral strength, pushed their way to leading places. Unlike a good many of his friends, he was a pacifist not only in the first but in the second European war. His pacifism was based on a strong religious conviction concerning non-resistance. He was equally resolute in his condemnation of the drink evil. Not long after he entered the House of Commons he created a stir by declaring in a public speech that he had seen many members drunk in the House, and that no party was exempt from this disgrace. The House could do no other than take cognizance of such a statement, and it placed on its records a resolution that Dr. Salter's words were a gross libel and a grave breach of privilege. But there is little doubt that at that time, with many new men entering Parliament, unaccustomed to its long hours and tedium, and finding there a bar which was not subject to licensing restrictions, Dr. Salter had good ground for his statement; he refused to apologize for it or amend or withdraw it. Similarly he was a great champion of free speech, and he actually resigned from the Labour Party in his own borough, which he had founded thirty years previously, because it refused free speech to Fascists. No one more than he detested Fascist tyranny, but it was exactly because he detested it that he was anxious that it should not be imitated by his friends.

In medical politics he took little part (he ceased membership of the British Medical Association in 1913), but he was an active member of the London Panel Committee in its early days, and scarcely a meeting passed without some rising of temperature due to his spirited interventions. Like many men with his sharp tongue and pugnacious jowl, he was, to those who knew him intimately, of the gentlest disposition. His deeds of kindness as a doctor, especially to the very poor, were a legend in South-East London, and in his elections his personality won the support of many who could not abide his politics. He was extraordinarily fortunate in his domestic life. Ada Salter, who died three years ago, like himself a member of the Society of Friends, fully shared her husband's ideals and helped him in his struggles. She was for many years a member of the L.C.C. and was actually mayor of Bermondsey when that borough first returned her husband to Parliament. He felt her loss keenly, and had been in failing health for some time.

It is with regret that we announce the death of Dr. SAMUEL JOHN WATT DONALD, of Brook Street, Sutton-in-Ashfield. Dr. Donald was 54 years of age, and had been ill since last December, but during recent months he appeared to be making progress. The news of his passing was received with deepest regret throughout the district, where his sterling qualities and kindly disposition endeared him to every section of the community. A native of Ballyrickard, Ireland, he graduated M.B., Ch.B., and B.A.O. at Queen's University, Belfast, in 1916; he immediately joined the Forces, and was sent to the Middle East, serving under the late General Allenby in Palestine, Iraq, and India. Later he completed his services with the Army of Occupation in Germany as a divisional D.A.D.M.S., and subsequently settled at Sutton-in-Ashfield until his untimely end. Among his other activities he took an enthusiastic interest in the St. John Ambulance Brigade; having begun in 1920 as a division surgeon he rose to the highest position in the county, that of County Commissioner. He attained the meritorious award of Serving Brother and Officer of the Order of St. John. During the war, amidst a very busy life, he joined the Home Guard as a major, and acted as C.M.P. for the Army. For some time it was evident that he was working under great mental strain. During his long illness that followed, many were the anxious inquiries of his friends, and they hoped against hope that he would be spared to enjoy some little respite from his arduous toil. He was truly one of the war's casualties.—P. M. G.

The many friends of the late Dr. JOHN L. MOIR in Anglesey and Cheshire learned with regret of his unexpected death at the age of 63. John Lowndes Moir, second son of the late John Moir, J.P., Brereton Hall, Sandbach, was born in 1882. Educated at Charterhouse School, Manchester University and Medical School, he graduated M.B., Ch.B. in 1908. Following the house appointments of junior and senior H.P. and senior H.S. at the Manchester Royal Infirmary, he practised at Congleton, Cheshire, from 1910 to 1931, holding the appointments of honorary medical officer Congleton War Memorial Hospital, certifying factory surgeon Congleton district, M.O. to the Post Office, and recruiting M.O. Congleton and district. From his retirement in 1931 John Moir lived at Cemaes Bay, Anglesey. He was called to the Bar by the Middle Temple in 1935 and became a member of the Northern Circuit. He volunteered for the R.A.M.C. in the last war but was rejected on medical grounds, and again volunteered at the outbreak of the present war, but his services were refused as he was over age. Moir then devoted his time to the work of the British Red Cross Society and Order of St. John, and became county medical officer and county civil defence officer of the Anglesey B.R.C.S. On the inception of the Home Guard he was made zone medical adviser with the rank of lieut.-colonel, and for several years undertook the whole of the medical work for the Anglesey County Home Guard unaided. G. P. W. writes: A staunch colleague and a great upholder of the dignity and traditions of his profession, John Moir gave of his utmost to any cause he took up. Prospective Conservative candidate for Ardwick, Manchester, from 1939 to 1944, he was the author of many pamphlets on medico-legal, medical, and religious subjects; a fluent speaker, he often addressed public audiences on these matters. In June, 1945, he was appointed by the Lord Chancellor to the post of medical member of the Pensions Appeal Tribunal, and was engaged on this work up to the time of his death. Deeply religious, he gave freely of his time and energy to any individual or organization he deemed worthy of help, and gave of his best to his patients, rich or poor, irrespective of the financial reward. In his practice at Congleton he was truly the "beloved physician," and innumerable old patients mourn his loss. His epitaph, chosen by himself some years ago, typifies his life: "We are more than conquerors through Him that loved us" (Romans viii, 37).

Dr. ARTHUR MURRAY WOOD, late of Leith, who died at Cockburnspath on Aug. 19, graduated M.B., Ch.B., with first-class honours, at Edinburgh University in 1900 and proceeded M.D. four lears later. He was elected F.R.C.P.Ed. in 1915 and took the D.P.H. of Edinburgh and of Glasgow. He had been resident physician at the Edinburgh Royal Infirmary and at the Sick Children's Hospital, and not long after graduation held office as senior president of the Royal Medical Society of Edinburgh. Dr. Wood served for more than 15 years as physician in charge of wards at Leith Hospital, and was afterwards appointed to the consulting staff of that institution. He devoted much time to the teaching of ambulance work in Leith, and for many years examined in first-aid work at Leith Nautical College. He joined the B.M.A. in 1911 and remained a member until the end of last year, when ill-health had overtaken him. His two sons are doctors, and one of them carries on the family practice.

Dr. JOSEPH WHITE, after many years spent in active practice in London, retired to Bournemouth in the early days of the present year. His anticipation of a well-earned rest was but briefly realized, and he died on Aug. 19. Of him, in a short sentence, it may be justly written that he was born a student and that he lived a student. His record at the University of Glasgow was set in due sequence in the Faculties of Arts, of Science, and of Medicine, and the degrees of M.A., B.Sc., and M.B., C.M. were each awarded to him with the distinction of "Honours"; he gained also a much-coveted prize in the shape of the Clark Scholarship. After graduation he continued his studies at Paris, Berlin, and Vienna, with particular attention to midwifery and gynaecology. Thus the fates seem to indicate for him a promising academic career. Yet his choice in the end was for the wide fields and opportunities of general practice, and he applied to these both a trained professional equipment and a personal enthusiasm and devotion. Little wonder that he quickly gained the confidence and regard of patients of all classes, for his ideal was one of service and his purpose was to realize this. With a trained mind and a high standard of accuracy he combined a gentleness of thought and understanding which engaged the affection of his patients and the regard of his colleagues. He knew well the charm of friendship and the values of the domestic atmosphere. In a word, in Dr. Joseph White were seen the modest scholar, the effective practitioner, and the honest man, and his record of service is quietly but firmly written. To his wife and family many friends and colleagues will desire to offer a tribute of sympathy and regard.—C. O. H.

Dr. G. N. P. CARRELL died suddenly at his home in Kingswood, Surrey, on Aug. 28. He was in his 90th year. Carrell was a student at Guy's in the 'eighties, and a contemporary and friend of Hale-White and Charters Symonds. He qualified M.R.C.S., L.R.C.P. in 1889 and was clinical assistant in the ophthalmic department. He went into practice at Ilford in 1894 and worked there for nearly 40 years. In that time he saw the small village grow into a large town. Its citizens owe a great deal to his long and devoted service. Carrell was a good doctor and a good man. The many thousands who were his patients will remember his charm, his humour, and his great affection. I know of no one who more closely approached the ideal of the family doctor. He married Sage Ward Haddow in 1894, who survives him. His son, Guy Carrell, is a surgeon lieut.-cmdr. in the R.N.V.R., and his daughter, Enid, is the wife of Lieut.-Col. Cokkinis, R.A.M.C., of St. Mary's.—A. J. C.

Universities and Colleges

UNIVERSITY OF OXFORD

The following medical degrees were conferred at the end of July:

D.M.—J. C. Neely.

B.M.—D. W. H. Barnes, David Gall, J. B. E. Baker, D. S. Cooke, D. St. C. Roberts, Elizabeth J. Horder, *D. G. Melrose, *Christopher Ounsted, *C. J. Radway, *J. S. Dismorr, Anthony Betty Shaw, N. T. Jace, G. E. Dixon, J. C. Lawrie, D. R. Wood, *C. H. Neville-Smith, *C. C. Draper, *J. D. L. Reinhold, *Mary Balf.

* Conferred in absence.

UNIVERSITY OF CAMBRIDGE

The following medical degrees were conferred at a Congregation held on Aug. 3. Only those whose names are marked with an asterisk received their degrees in person; all the other degrees were received by proxy.

M.D.—W. R. Billington, K. W. Donald, C. M. Fletcher, M. I. A. Hunter R. A. Shooter.

M.B., B.CHIR.—N. K. Connolly, W. P. D. Ross, J. P. D. Mounsey, C. J. H. Paget, F. S. Sinker, R. H. Whitworth, C. G. Attenborough, R. E. B. Spencer, A. R. C. Butson, P. M. Jeavons, B. W. Pay, I. P. Williams, I. D. P. Wootton, A. R. Buckley, I. S. Hodgson-Jones, D. A. Pyke, M. G. Thorne, R. G. M. Longridge, William Waugh, A. M. H. Bennett, R. E. Church, J. M. Drew, J. W. B. Forshaw, J. B. Lawson, C. M. Monro, V. R. Pickles, David Wilkes J. H. F. Wood, C. H. Kinder, A. J. Underwood-Whitney, J. M. Walshe, J. C. Sloper, James Crichton, A. G. Dingley, R. B. Wilson, J. A. Dew, P. F. Boreham, H. R. Mallows, J. R. Smythies, David Wilson, M. F. Bethell, R. A. Green, N. B. Malleson, J. R. Moffatt, K. M. Nuttall, O. L. Wade, S. P. Wrightson, J. F. Fisher, A. D. Beard, Emeric Halász; *N. T. Welford, *I. M. P. Dawson, *D. G. Abrahams, *G. R. E. Naylor, *K. E. E. Read, *D. A. W. Edwards, *D. W. S. Sheldon.

UNIVERSITY OF LONDON

Alterations in and additions to the regulations for diplomas and certificates administered by the University Extension and Tutorial Classes Council, including the postgraduate diploma in psychological medicine, have been published from the wartime address. All communications regarding these regulations should be sent to the University Extension Registrar, University of London, Imperial Institute Road, South Kensington, S.W.7. In 1946 all examinations normally due to begin between the dates June 10 and July 31 (both inclusive) will begin one week later.

The following candidates have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN MEDICAL RADIOLOGY.—J. J. Stevenson *Part I:* R. Astley, J. Borrowdale, D. Brash, L. Ceballos, E. Giordani, G Hollingsworth, S. Josephs, Gwenllian B. Morgan, R. S. Murray, J. F. Nicholl A. W. O'Farrell, L. G. Picciotto, R. C. Tudway, F. Zanelli.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

The autumn course of professorial lectures on anatomy, applied physiology, and pathology will be delivered at the College, Lincoln's Inn Fields, on Sept. 24, 26, 27; Oct. 1, 3, 5, 8, 10, 12, 15, 17, and 18. Prof. John Beattie's course on applied physiology at 2.30 p.m. each day will be devoted to kidney function. Prof. R. A. Willis's course on pathology at 3.45 p.m. each day will be devoted to tumours. Prof. A. J. E. Cave's course on anatomy at 5 p.m. each day will begin with a series of demonstrations. All three courses are open to medical practitioners and advanced students.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

The report for 1944 of the curator of the laboratory of the Royal College of Physicians of Edinburgh (Dr. A. Fergus Hewat) states that the reports which have issued from the laboratory during the year numbered over 25,000, making a record. Dr. Cranston Low has been appointed superintendent of the laboratory. In mentioning that the research work has gone steadily forward, Dr. Hewat utters a warning against attaching too much mystery to the term "research" or suggesting that it must be conducted under conditions of cloistered seclusion. "It may be necessary to look for future activity of the laboratory on the lines of community service and to combine this work with appropriate research on the abundant material provided. . . . Research is not necessarily to be looked on as a set piece, or even as a major piece of work, so long as it does usefully contribute, like the individual brick, to a final edifice." Brief accounts are given of the work done under Lieut.-Col. W. F. Harvey in histology and haematology, and under Dr. W. O. Kermack in biochemistry. There are also departments of bacteriology and of mathematics and statistics. The histological collection of the laboratory together with clinically recorded tumour material, mainly of Edinburgh, is being used by Dr. Blackwood, pathologist to the Scottish mental hospitals, in an endeavour to make a comprehensive and critical survey of tumours of the nervous system—a study which will require a long period of analytical and statistical investigation.

Medical Notes in Parliament

Age Incidence in Diphtheria

Mr. VIANT inquired on Aug. 21 what were the ages in the 23,152 cases finally diagnosed as of diphtheria in 1944 and in the 934 fatal cases.

Mr. BEVAN said the particulars requested were:

Age Group	Cases	Deaths
Under 5	4,171	351
5–9	7,200	342
10–14	4,417	104
15–24	4,306	64
25 and over / Age unknown	3,058	72 / 1

Mr. Bevan added that information about immunization was not available for all cases of diphtheria because it was derived from returns by local authorities relating to the immunization campaign, affecting only children up to the age of 15. These returns, moreover, do not include immunizations by doctors in private practice.

Milk

Dr. SUMMERSKILL said on Aug. 23 that progress toward enforcement of the standards of milk at the time of sale to the consumer set out in the White Paper had been disappointing. No areas had yet been specified under Regulation 55G. Until the deficiencies of plant, equipment, and buildings could be made good, imposition of heat treatment of milk upon all dairymen would not be practicable. Considerable progress had been made in this direction and the output of new plant was improving.

Mr. BEVAN states that a high proportion of school milk is now either heat-treated or tuberculin-tested. He is consulting the Minister of Food on what further action can be taken respecting the supply of adequately heat-treated milk.

Tuberculosis in Ex-Service Men: Treatment Costs

Capt. BULLOCK on Aug. 22 asked the Minister of Health to reconsider the present arrangements relating to men discharged from the Army suffering from tuberculosis so as to ensure that their institutional treatment should always be a charge upon the State. Mr. BEVAN said responsibility for treatment of tuberculosis rested upon local authorities. Where the Ministry of Pensions accepted tuberculosis in a man discharged from the Army as attributable to or aggravated by war service, payment was made by that Department to the local authority concerned at an agreed capitation rate in respect of approved cases of institutional treatment. In any other case the cost of such treatment was borne by the local authority's tuberculosis service, which attracted Exchequer grant.

Medical News

The conference of the Association of Special Libraries and Information Bureaux will be held during the week-end Sept. 15–16 at the Portland Hall (Polytechnic Extension Building), Little Titchfield Street, London, W.C. An inclusive fee of 30s. per head to members (£2 to non-members) will cover admission to all sessions, lunch and tea both days, and a free copy of the report of the proceedings. Application forms can be obtained from the Aslib office, 52, Bloomsbury Street, W.C.1.

A meeting of the members of the British Association of Physical Medicine will be held at 11, Chandos Street, W., on Wednesday, Oct. 24, at 5 p.m., when Dr. James MacDonell will read a paper on "Sleep Posture—Its Implications," to be followed by a discussion.

The address of the Socialist Medical Association is now 35, Long Acre, London, W.C.2.

According to a dispatch from the Delhi Correspondent of the *Times* the Government of India created on Sept. 1 a Department of Agriculture, a Department of Health, and a Department of Education, in place of the existing single Department of Education, Health, and Lands. Sir Sardar Jogendra Singh, Minister in charge of the conjoint department in the Viceroy's Executive Council, will for the time being take charge of all three departments of the central Government.

Dr. Cecil Gordon Roberts, second medical officer to the General Post Office, has been appointed Chief Medical Officer in succession to the late Dr. W. Logan Scott. Dr. M. C. W. Long, assistant medical officer, has been appointed second medical officer.

Courses of ten lectures on "The Psychology of Frustration and Fulfilment in Adult Life," arranged by the Provisional National Council for Mental Health, will be given at Sheffield, Leeds, Bradford, Manchester, and Liverpool throughout the ten weeks from October 1 to December 7. They will run concurrently, the weekly speakers and their subjects being: Dr. Edward Glover, "The Psycho-analytic Approach"; Dr. Lois Munro, "The Psycho-analytic Approach"; Dr. R. G. Gordon, "The Celibate Man"; Dr. Noel Harris, "The Married Man"; Miss Lloyd Baker, "The Celibate Woman"; Dr. Winifred Rushforth, "The Married Woman"; Principal J. H. Nicholson, "Co-education of Young Adults"; Dr. J. A. Hadfield, "Parenthood"; Dr. H. Crichton-Miller, "Frustration and Authority" and "Evolution and Fulfilment." Tickets (for the course, £1) and further information may be obtained from the offices of the Provisional National Council for Mental Health, 39, Queen Anne Street, W.1.

Officials of the Memorial Cancer Hospital, New York, have accepted a grant of $4,000,000 (£1,000,000) from Mr. Alfred P. Sloan, chairman of General Motors Corporation, to the Sloan-Kettering Institute for Cancer Research at the Memorial Centre. The grant will come from the Alfred Sloan Foundation, and half the money will be for buildings and the rest will provide $200,000 annually for ten years towards working costs. Dr. Charles F. Kettering, director of research at General Motors, will be responsible for the organization of industrial techniques for cancer research, but the Corporation will not concern itself with the programme of work. A public campaign is to be launched to raise the $3,000,000 to $4,000,000 required to complete the hospital.

The Minister of Health, the Right Hon. Aneurin Bevan, M.P., has appointed Major Donald Bruce, M.P., to be his Parliamentary Private Secretary.

Viscount Dawson of Penn, by his will, directed that unless conditions arising out of the war made it too difficult, or doctors in attendance thought no service to knowledge could follow, a post-mortem examination of his body should be made. "I do this because I think the public do not sufficiently realize the importance of post-mortem examinations being made and the advantages to knowledge and therefore to future generations which will thus accrue. We do not hesitate to have operations performed on our bodies when we are alive and when circumstances require it. Why, then, should we mind operations (which are done with the same care, the same gentleness, and I may add the save reverence) being done to our bodies when we are dead? Surely this is a rightful service which the dead should give the living. The benefit of such service to the living is very great."

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* the incidence of infectious diseases, with the exception of measles and dysentery, remained at almost the level of the preceding week. Measles returns were 354 fewer, and those of dysentery 41 fewer.

The trend of whooping-cough varied: notifications fell in the north and south, but rose in the midlands, the total for the country increasing by 31. Lancashire reported a rise of 14 in returns for diphtheria. The decrease in measles notifications was general, except for rises of 27 in Kent and 16 in Durham.

The only fresh outbreak of dysentery was in Cambridgeshire, 15 cases. The other chief centres of infection were Essex 52 (Maldon M.B. 39), Lincolnshire 33, Surrey 22, London 22, Middlesex 16, Glamorganshire 16, Lancashire 13, and Warwickshire 10.

Six cases, one fatal, of infantile paralysis have occurred among Ilford boys who recently returned from a Scouts' camp, and the sister of another boy has contracted the disease. The local medical officer of health has given the camp a completely clean bill of health, and considers the camp in no way responsible.

In *Scotland* diphtheria notifications rose by 18, and those for dysentery by 25. In Glasgow the incidence of dysentery rose from 13 to 28, and it was here also that more than half the cases of diphtheria were notified.

In *Eire* there was an increase of 16 in the notifications of diphtheria. The outbreak of diarrhoea and enteritis in Dublin C.B. rose from 54 to the very high level of 88 cases.

In *Northern Ireland* scarlet fever notifications rose by 21, and those for diphtheria by 9. Four members of one family in Londonderry have contracted typhoid.

Week Ending August 9

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,001, whooping-cough 1,152, diphtheria 409, measles 1,151, acute pneumonia 318, cerebrospinal fever 47, dysentery 232, paratyphoid 17, typhoid 12, poliomyelitis 31.

No. 33

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Aug. 18.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1945					1944 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	39	2	14	1	3	34	1	26	1	1
Deaths		—	—				—	1		
Diphtheria	351	13	113	69	27	393	10	132	94	14
Deaths	8	1	3	—	—	8	—	1	—	—
Dysentery	259	22	72	1	—	248	14	95	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	4	2	—	—	—	1	—	1	1	—
Deaths		—					—			
Erysipelas			31	7	—			36	5	4
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				97					124	
Deaths	49	4	6	20	7	58	4	47	15	2
Measles*	1,327	66	35	24	2	1,606	39	78	23	20
Deaths	—	—	1	—	—	2	—	—	—	—
Ophthalmia neonatorum	56	2	9	—	—	58	—	20	1	—
Deaths										
Paratyphoid fever	4	—	2 (B)	—	2 (B)	5	—	3 (B)	—	—
Deaths	1	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal†	275	16	—	4	3	345	7	4	1	2
Deaths (from influenza)	3	—	—	—	—	5	1	3	2	—
Pneumonia, primary			96	11				133	10	
Deaths		11		4	4		22		4	2
Polio-encephalitis, acute	1	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	27	4	—	4	2	14	—	10	1	—
Deaths		1					—			
Puerperal fever		1	7		—		—	10		—
Deaths										
Puerperal pyrexia‡	129	10	6	3	—	134	8	11	—	—
Deaths		—					1			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	922	65	165	8	44	1,068	24	181	29	44
Deaths	—	—	—	—	—	1	—	—	1	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	5	—	—	3	4	8	—	3	10	3
Deaths	1	—	—	—	—	2	—	—	1	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	967	47	22	22	4	1,603	60	36	68	7
Deaths	1	—	1	—	1	3	3	—	2	1
Deaths (0–1 year) Infant mortality rate (per 1,000 live births)	265	29	33	28	14	300	26	88	52	19
Deaths (excluding still-births)	3,617	522	524	186	109	3,853	570	558	177	92
Annual death rate (per 1,000 persons living)			11·1	12·0	§			12·8	11·5	§
Live births	5,748	693	764	346	249	6,406	496	941	325	288
Annual rate per 1,000 persons living			15·3	22·3	§			19·1	21·1	§
Stillbirths	175	18	16			226	14	20		
Rate per 1,000 total births (including stillborn)			21					21		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

§ Owing to movements of population, birth and death rates for Northern Ireland are still not available.

Letters, Notes, and Answers

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ANY QUESTIONS?

Histidine and Peptic Ulcer

Q.—*In view of the experimental evidence that histidine is necessary for the adequate nutrition of the carnivorous stomach, and in view of many clinical successes from the use of histidine in gastric and duodenal ulcer, why is this form of treatment not more generally used? Is it because the patient dreads the use of the needle, and persuades the doctor first to try rest in bed, alkalis, and a milk diet?*

A.—There are, of course, many "cures" for peptic ulcer, including such diverse substances as vitamin A, alkyl sulphates, pituitary snuff—and histidine. Their reputation is due to the fact that peptic ulcer is a remittent disease, and remissions are particularly likely to occur under the influence of psychic stimuli. Unless a new treatment is carefully controlled, it may well appear successful at first. Histidine treatment has by now, however, been very carefully tested in animals and man, particularly in the U.S.A., and there is no case for using it. It is not effective in experimental ulcer in animals. Several well-controlled trials in man have shown that it is less effective than the usual diet and alkalis, and that injections of distilled water give equally good results. Some suggestive work has been done on the inhibition of histamine by histidine, the excretion of histidine in normal pregnancy, and the excretion of histamine in toxaemia of pregnancy (Kapeller-Adler, R., *J. Obstet. Gynec.*, 1941, **48,** 141), but there is no evidence that similar disturbances in metabolism occur in peptic ulceration. Finally, it should be noted that the dose of histidine commonly used in the treatment of peptic ulcer, 0.2 gramme daily, is probably only one-tenth of the normal intake in the food, and that recent American work on young men taking diets in which the nitrogen is provided by amino-acid mixtures rather contradicts the view that histidine is an essential amino-acid in man.

Vitamin K

Q.—*Apart from the prophylactic use of vitamin K in haemorrhage of the newborn, in what other conditions is it of value?*

A.—Vitamin K may be of value in any condition in which the prothrombin content of the plasma is reduced. Deficiency of prothrombin is responsible for the haemorrhagic tendency in jaundice; if this is due to obstruction it will usually respond to vitamin K, but if it is due to parenchymatous disease of the liver it will not. The response to vitamin K may therefore be used as a diagnostic test. The prothrombin level is depressed by the anticoagulant drug dicoumarol, but this action can be reversed in emergency by very large doses of vitamin K—i.e., 100 to 500 mg. A similar but less striking depression of prothrombin occurs during heavy dosage with salicylates, and it has been recommended that 1 mg. vitamin K should be given for every gramme (15 grains) of salicylate. Recently it has been claimed that a high proportion of patients with chronic urticaria show a deficiency of prothrombin and are relieved by vitamin K in a dosage of 2 mg. t.d.s., a.c.

Vaccination and Diphtheria Immunization

Q.—*Is there any practical reason why a child should not be vaccinated against smallpox and immunized against diphtheria on the same day?*

A.—Vaccination against smallpox is usually done some time between the second and sixth months of life, while inoculation with A.P.T. against diphtheria is usually done about the first birthday. It is probably wiser to vaccinate early rather than late, as more severe reactions seem to occur with older infants, and in any case there is a statutory obligation to do so before the child is 6 months old. The question then arises, "Should the infant be given its diphtheria prophylactic at 6 months of age or earlier?" Children under 1 year, even when they receive maternal antibody via the placenta, may develop diphtheria, and there is some evidence that infection in infancy has become more common in recent years. It would therefore seem advisable to begin immunization at 5 to 6 months of age. Now, there is no objection to combining two *bacterial* antigens, since the one does not interfere with the other in stimulating antibody production; but when two viruses are simultaneously injected there may be an "interference" phenomenon, and it is therefore not possible to say if vaccinia would interfere with the stimulation of antibody by the diphtheria antigen. Thus, while there is a case for early immunization against diphtheria, it would probably be wiser to begin the course after vaccination has been successfully completed. It should also be remembered that the child responds less well to antigenic stimuli in early infancy than it does later on, so that the initial dose should be adequate (say 0.5 c.cm. A.P.T.) and a boosting dose should be given 2 to 3 years later.

Iodine for Asthma

Q.—*A man of 54 has been taking Lugol's iodine, 3 drops twice daily for 2 years, as treatment for asthma. He found the attacks much less frequent and less severe during this period and suffered from no side-effects. It was discontinued for six months, but he now wishes to resume the same treatment. Is this desirable?*

A.—Iodine and iodides are of the greatest value in the treatment of asthma, particularly in cases associated with bronchial infection. The only contraindication to their use would be the occurrence of iodism. The usual symptoms of this are nasopharyngeal irritation as from coryza, skin eruptions, nausea, diarrhoea, cachexia, and depression.

Foot-up Position in Shock

Q.—*An accepted practice in cases of shock, especially after haemorrhage, is to raise the foot of the bed. Is there sound evidence that the circulation is better in this position than lying flat? It is uncomfortable in health, and I have found patients so tilted thankful when allowed to resume the horizontal.*

A.—Asmussen *et al.* (*Surgery*, 1940, **8,** 604) showed conclusively that in normal men the cardiac output (Grollman method) and blood pressure were decreased and the pulse rate increased in head-up tilt compared with the horizontal, and in the horizontal compared with a foot-up tilt of 30 or 60°. This was particularly marked if the effective blood-space was increased by reactive hyperaemia, and conversely less marked if the leg blood-space was obliterated by cuffs. Duncan, Sarnoff, and Rhode (*Ann. Surg.*, 1944, **120,** 31) have provided some confirmation of these findings for the smaller tilt used in clinical practice (7.9°) in patients suffering from severe haemorrhage. The mechanism is this: with decrease in blood volume (e.g., after a severe haemorrhage) or increase in blood-space (as in fainting or spinal anaesthesia, due to peripheral vasodilatation), a decrease in venous and right auricular pressure occurs, leading to a fall in cardiac output and blood pressure. In the head-up position, blood is pooled in the veins of the legs, and right auricular pressure decreases further. With the foot-up position, right auricular pressure is increased and blood is drained back to the heart from the veins of the legs, with resultant improvement in cardiac output. If, however, "shock" is due to cardiac failure, or if the heart is already overloaded, as in chronic anaemia, further increase in venous pressure (already above normal) would be harmful. Here, therefore, the horizontal or foot-up position is contraindicated. It all depends, in fact, on what you mean by shock!

Pregnancy and Diabetes

Q.—*Has any recent progress been made towards improving the chances of pregnancy in diabetics, and is one justified in encouraging it in women whose present treatment does not require insulin? Can the existence of diabetes be taken as the main cause of impairment of sexual function—e.g., frigidity—or should one search further?*

A.—The chances of pregnancy occurring in a diabetic woman have been enormously improved by insulin. The question rather suggests that the patient is anxious to avoid insulin and is having an inadequate diet; and if this is the case inadequate treatment of the diabetes may be responsible for the infertility and frigidity. If the condition persists when a diet is given containing over 150 g. of carbohydrate with an adequate caloric value and sufficient insulin to maintain the blood sugar within reasonable limits, further search should be made for another cause of impaired sexual function.

Mastitis and Breast-feeding

Q.—*If a breast goes through the stages of engorgement, mastitis, suppuration, at what precise stage should the baby be taken off that breast?*

A.—There will probably be some diversity of opinion as to the answer to the third part of this question, and in any given case it will always require a nicety of judgment to decide when breast-feeding should be discontinued. Engorgement is not an indication for taking the baby off the breast, but the writer's view is that as soon as there is definite evidence of mastitis (before suppuration occurs) feeding should be discontinued, and so should all manipulations of the breast, which should be put at rest.

Stilboestrol for Suppressing Lactation

Q.—*How much stilboestrol is usually required to suppress lactation? What is the best preparation to use and how should it be administered? If lactation reasserts itself after a course of treatment, what further steps should be taken?*

A.—To prevent or suppress lactation stilboestrol is usually given by mouth, starting with a large dose and gradually reducing over the course of four to seven days. Various schemes of dosage are employed, and in general it can be stated that smaller amounts are required when treatment is begun immediately after delivery than if it is delayed until lactation is already established. If begun early, the following scheme works well: 5 mg. b.i.d. on the first day, 2 mg. t.d.s. on the second day, and then reduce the total daily dose by 1 mg. a day, completing the course in seven days. Alternative oestrogens employed by the oral route are hexoestrol in similar dosage, and dienoestrol in about one-fifth of the above doses. It is said that a single intramuscular injection of 12.5 mg. hexoestrol dipropionate if given within three days of delivery, is sufficient to prevent lactation. For further details see Josephine Barnes (*Journal*, 1942, **1**, 601) and F. Prescott and Margaret Basden (ibid., 1944, **2**, 428).

The breasts sometimes show sign of some activity 24 to 48 hours after completion of the course of treatment. If this is minimal no treatment at all is required. If necessary, however, a further course of stilboestrol can be given, say 4, 3, 2, 1 mg. on four successive days.

Sex Hormones to Control Uterine Bleeding

Q.—*Would you discuss the use of oestrogenic preparations in the treatment of menorrhagia and metrorrhagia? For both these conditions I have been using progesterone, 2 i.u. daily for four days before the expected date of the period, and have had fair success, especially in menorrhagia. Recently a colleague advised that a patient with metrorrhagia, who had been having "periods" which lasted from seven to ten days and occurred about every two or three weeks, should have stilboestrol 1 mg. t.d.s. for four days, starting on the fourth day of the period and repeated whenever irregular bleeding occurred. I cannot see the rationale of this treatment, as surely stilboestrol will only increase the haemorrhage? Recently, on the advice of a colleague, I gave another patient (who began profuse bleeding six weeks after a normal confinement) tab. dienoestrol 0.1 mg. t.d.s.; within two days haemorrhage had ceased. Why should oestrogenic preparations be used in conditions which suggest a lack of progesterone?*

A.—A complete answer to this question would be a lengthy one, and the inquirer should refer to one of the textbooks on sex endocrinology for the details. Briefly it can be stated that functional uterine bleeding is either ovular or anovular—i.e., occurs from an endometrium previously stimulated by progesterone, or only by oestrogen. Most bleedings take place when the hormonic stimulus is reduced or removed. Progesterone-deprival haemorrhage can be controlled by progesterone but not by oestrogen. On the other hand, oestrogen-deprival haemorrhage can be controlled either by substituting progesterone or by giving oestrogen to raise the blood level again. In practice, therefore, progesterone is usually employed, because not only will it control either type of haemorrhage, but it is more rational in that it supplies the missing hormone and completes the oestrogen–progesterone cycle, thus following the natural sequence of events. However, not all anovular forms of bleeding are due to oestrogen withdrawal; rather they may be due to incomplete stimulation with oestrogen, so the endometrium remains atrophic or only in an early proliferative phase. In such cases progesterone may not control the bleeding, because for it to be effective the endometrium must be well primed with oestrogen. Under such circumstances oestrogen will, however, complete the proliferation and control the bleeding—at any rate temporarily—during the period of its administration.

It is always wise to hesitate to give oestrogen for the control of uterine bleeding, because of its tendency to produce endometrial hyperplasia and to result in further heavy haemorrhage when treatment is suspended. Evidence to show that it is indicated (such as the finding of atrophic endometrium on endometrial biopsy) is desirable before it is given, and even then the dosage should be worked out carefully. Also there is much to be said for continuing treatment after the immediate bleeding is controlled, and to stimulate the natural ovarian cycle by giving first oestrogen and then progesterone over a period of three to four weeks.

Digestive Disorders and Swallowed Sputum

Q.—*Is there evidence that the swallowing of sputum and nasal mucus in bronchial (chronic) patients has any adverse effect on the digestive process?*

A.—The human air-conditioning system is designed on the principle that bacteria and morbid secretions are trapped and directed into the pharynx, whence they are swallowed and sterilized by the gastric secretion. It is probably for this reason that digestive symptoms are conspicuous by their absence in chronic sinusitis and bronchiectasis. When digestive symptoms occur they can usually be explained by pyrexia and the haematogenous spread of toxins. Owing probably to its waxy coating, the tubercle bacillus is more resistant to digestion and more likely to infect the intestine, and the association of gastro-intestinal symptoms with cough should always suggest the possibility of tuberculosis.

Hydronephrosis and Calculus Formation

Q.—*A man of 40 has periodic headache recurring every four weeks and lasting four days. Associated with this are the following symptoms: renal colic, vomiting, blurring of vision, and ptosis of eyelids. He then passes a small calculus about 2 mm. long. This condition has existed for a number of years. The blood pressure is 160/90; blood urea, 30 mg. per 100 c.cm. of blood; examination of the urine shows the presence of calcium oxalate and uric acid crystals. There is slight hydronephrosis of the right kidney, but pyelography reveals no calculus. What further steps of investigation should be taken, and what should be the treatment?*

A.—The presumption is that the hydronephrosis is favouring the formation of calculi, and that the passage of the calculi gives rise to the symptoms. It is also probable that an element of infection is present. The first step should be to have one of the small calculi analysed. If it proved to be uric acid, the uric acid content of the plasma should be estimated; if the level is above normal the patient should be treated as for gout. If the stone is mainly calcium salts, the possibility of hypercalcaemia from a parathyroid adenoma should be considered. If the stone is urate or oxalate, the urine should be kept alkaline, *p*H 6.0 to 7.0, by means of an alkaline diet and an alkaline mixture. With any type of calculus the intake of water should be at least 2,000 c.cm. a day and foci of infection should be removed. To clear up infection of the urinary tract it would be wise to take a small dose of sulphathiazole for a prolonged period—e.g., 0.25 to 0.5 g. t.d.s.

Diabetes and Epilepsy after Meningitis

Q.—*At the age of 6½ a female child developed meningococcal meningitis, which was rapidly cured by sulphapyridine. Eight months later the child was found to have severe diabetes, controlled with difficulty by ordinary insulin and protamine-zinc-insulin. Nine months later the same child has developed epilepsy. Is there any connexion between the three illnesses? There is no family history of either diabetes or epilepsy.*

A.—Epilepsy is not an uncommon sequel of meningococcal meningitis, which would seem to be the case in this patient, in spite of the rapid cure by sulphapyridine. Diabetes does not appear to be recognized as a sequel of meningococcal infection, but the present history at least arouses the suspicion that the infection caused damage to the pancreas.

INCOME TAX

Replacement of Car

P. B. proposes to sell his old car and buy another in replacement. He has had depreciation allowance in past years. What can he claim as an expense?

*** It is presumed that the old car will be sold for a larger amount than its present "written-down" value. In that case no "obsolescence" allowance will be due, and P. B. should claim, not the cost of replacement, but a depreciation allowance based on the cost of the new car.

Taxation of Pensions

W. W. draws a small pension from a public authority by whom he was employed. He states that during his service he suffered deductions from his salary to provide the pension, but paid tax on his salary in full.

*** The pension is undoubtedly liable to assessment to income tax. Deductions from salary to provide such pensions are usually allowed automatically as "expenses." If W. W. did not receive the benefit of such an allowance, he may have a claim to repayment of some tax for recent years.

Voluntary Disposition of Income

A. G. signed an agreement in March last agreeing to pay a certain annual sum for seven years for the benefit of a specified charity. A simple "agreement" is ineffective for the purpose; what is required is a deed under seal. In an attempt to put the matter on the proper legal footing A. G. added the attestation clause appropriate to a deed to the existing agreement and had it witnessed. The income-tax authority points out that the document is stamped as an agreement, not as a deed, and will be effective only as from the date of its execution under seal.

*** We agree, and suggest that A. G. should submit the existing document for stamping. An agreement and a covenant by deed are entirely different legal instruments and the agreement as such is legally ineffective.

LETTERS, NOTES, ETC.

Intravenous Adrenaline

Lieut.-Col. D. C. MACDONALD (Farnborough) writes: I have recently returned from Italy and have had no *Journals* since May. In the first one I opened since my return I find an answer to a question on intravenous adrenaline (July 14, p. 73). I do not know who replies to these questions, but his last paragraph is unfortunate, if not indiscreet. He refers to a recent investigation into the use of adrenaline in malaria, the results of which have not yet been published. If he is referring to the investigation carried out in Italy by the R.A.M.C. he will find that the results of this investigation cannot be relied on. Over a year ago I invited first the Allied Control Commission and then the consulting physician A.F.H.Q. to send reliable observers to Palermo to see for themselves the remarkable results obtained by Prof. Ascoli, but, although I made tentative arrangements for accommodation, food, and transport, no one came. There is none so blind as he who does not wish to see. Americans reacted differently. They came, they saw, and they went away convinced that there was something in it. Perhaps your amanuensis would say that they went away with "dust in their eyes," but in America experiments are being carried out with "something more powerful than quinine or atebrin." To quote from their press: "The search for a quinine substitute following Pearl Harbour brought forward atebrin, but the *failure* of either drug to *provide a permanent cure* led to the present procedure." What an admission of failure! When the Conference of Army Physicians, C.M.F., was held in Rome (Jan. 29 to May 3, 1945) I asked permission to speak on the use of adrenaline in malaria; I was allotted *five minutes* as a very great favour and there was no discussion, the chairman simply dismissing the matter in one sentence. I have spoken to more than one medical specialist, and the answer was the same: "I should get 'bowler-hatted' if I carried out Ascoli's method." This, to my mind, was rank cowardice in the face of an enemy that is winning all along the line because our methods are obsolete and futile. Does your correspondent imagine that a man with one of the best brains in Europe would work on this for thirty years if it were completely valueless? What about the works of 150 independent observers written on this same important subject? Do they go for nothing? Would the Italian Army make this treatment compulsory, as it has done, if it were valueless? No, Sir! With one stroke of his little pen your correspondent seeks to wipe out one of the most astounding discoveries of all time. Ascoli will join the ranks of men like Jenner, Pasteur, and many others, who in life were ridiculed by an unbelieving profession but whose works prevailed despite it. The Italian Government has recently set up a Malaria Research Centre in Palermo with Ascoli at the head. Here doctors and students are being trained in Ascoli's technique. Two large malarious tracts of Sicily have been delineated, exactly similar in every detail, and in one malaria will be treated with quinine products only and in the other with adrenaline alone. I should advise the investigators referred to by your correspondent to hold up their report, which might be the subject of ridicule in years to come.

Sleep-walking

Dr. L. J. BENDIT (London, W.C.) writes: The recent comments on the treatment of sleep-walking (Aug. 18, p. 241) rather dismay me. They seem to be on a par with treating renal colic with morphine and leaving the calculus where it is. Surely it is time that the profession realized that symptoms like somnambulism are based on psychological trouble and are manifestations of anxiety and hysteria. Thus to "cure" such a thing by making the child step into cold water is simply to ignore the disease and to treat a symptom. The proper way to deal with such cases is in a child-guidance clinic. I may perhaps be allowed to mention a rather dramatic case, where a child of 8 suffered from sleep-walking. The question seemed to resolve itself into finding out what she was looking for in her wanderings. When I had made fairly sure of my ground I told her where babies came from, in such a way as not to embarrass her and so that, if I had missed the mark, she would not be interested. Apparently I had made a good shot: she immediately stopped her nightly peregrinations. Needless to say, many cases are not so simple; nor are they necessarily due to sex traumata. But they are certainly due to anxiety repressed, and this needs psychological treatment, and not either dope or tricks.

Paronychia of Toe

Dr. W. F. COOPER (Kingston Hill) writes: I wrote a note on the use of a file for ingrowing toe-nails, and got reprimanded by one chiropodist who, however, had never had a piece of nail wrenched out. But the case in the *Journal* of Aug. 11 (p. 203) illustrates the advantage. The man wants to continue at work, and he can't do that if he has a piece cut out—it is painful, even if one remains in bed. Filing the middle part will ease pain due to ingrowing nail, and finally abolish the condition; one may be able to file over the pus. One wants a bastard-cut flat file, with safety edge (or second cut); and the safety edge is used to guide the work with a finger. If the safety edge is so used the nail can be abraded right to the skin. May I point out another important detail. The filing is done best when the nail is cold; but if the whole foot is immersed in hot water for some time, as hot as possible, the chitin alters its molecular condition and becomes soft; then one can slit the nail where there is pus, but not cut a piece out, so that any remedy can enter. I should smear the toe well with acriflavine emulsion, cover with one layer of oiled silk, and let him work. He can dress it often, himself. The hot water will help the inflammation. The man's urine is almost certainly acid, and he would do much better if given alkalis with small repeated doses of mag. sulph. until the urine is nearly neutral. I use a universal indicator for this. Addition of phosphates and syrup. ferri phosph. would also do good.

Nocturnal Cramp

Dr. J. DONALDSON SANER (Edgware) writes: In answer to the question about nocturnal cramp in legs and feet (Aug. 18, p. 240), I was given a tip years ago by my cousin, the late Alfred Russell, M.D., of Wimpole Street and Devonshire Place, to take a teaspoonful of bicarbonate of soda in water just before going to bed each night. A simple remedy, but it acted like a charm.

Dr. T. L. CRAWHALL (Watlington) writes: Nocturnal cramp can usually be prevented by a tablespoonful of glucose taken on retiring. I speak from personal experience.

Resuscitation Across a Barrel: Information Wanted

Dr. F. C. EVE (Beverley) writes: Dr. John Yates inquires (July 28, p. 144) if this ancient method is similar to the rocking method. Presumably it is, but I have not been able to find out exactly how it was done. For efficiency, it is now considered necessary to rock 45 degrees each way. Hence the circumference of the barrel should be twice the height of the victim when kneeling. This would demand a barrel about a yard in diameter. One seldom sees so large a barrel nowadays. Can anyone tell me the sort of barrel which would quickly be available on a ship a century ago? Reliable witnesses who have seen this method in use will soon be extinct. I would like to rescue it from oblivion in my booklet, *Artificial Respiration Explained*, now being printed by Messrs. Livingstone. Can anyone kindly and promptly give me facts or references? I do not think it would be nearly so effective as the rocking method.

Dermatitis of Navel

Dr. E. GALLOP (London, S.W.) writes: With reference to the question and answer on the above subject (Aug. 18, p. 240), I think that the possibility of ringworm should be kept in mind in this case. I had a similar one that cleared up on applying pigmentum contra tineam of the *Extra Pharmacopoeia*.

Effects of Tobacco Smoking on Health

Dr. NIGEL W. ROBERTS (Cottingham) writes: I welcome the excellent and timely letters from Dr. Lennox Johnston (July 21, p. 98) and Dr. Sybil Tremellen (Aug. 18, p. 233), and I agree whole-heartedly with every word. But it will be of no avail for the medical profession to denounce tobacco addiction so long as so many of the members thereof are themselves addicts, and are, pretty obviously, content to remain so. An ounce of example is worth a ton of precept; it is regrettable to have to record that the worst tobacco-laden atmosphere I ever endure is that of the meeting-place of the local branch of the B.M.A.

Dr. W. A. BELLAMY (Waddesdon) writes: Dr. Sybil Tremellen's letter (Aug. 18, p. 233) calls for comment. It contains far too many generalizations to be of any real value as a scientific article. Isolated cases prove nothing; because Winston Churchill is an inveterate cigar smoker and has shown a moral and physical stamina unsurpassed by millions of total abstainers it does not mean that cigar smoking is a panacea for all our ills to-day. The odd cases quoted by Dr. Tremellen prove, as I say, nothing; neither does the fact that I took my company on a "ten-miles-in-two-hours" (in full marching order, three months before my fortieth birthday) on forty cigarettes a day prove anything either.

"Atomic Pregnancy"

Dr. H. G. HOWITT writes: A patient told me this morning that she had recently undergone an operation for "a ruptured atomic pregnancy." It is truly amazing to note the rapidity with which the latest scientific inventions are adapted to modern medicine.

Disclaimer

Dr. E. C. THOMAS and Dr. MARGARET THOMAS, of the Edinburgh Medical Missionary Society, writing from the Victoria Hospital, Damascus, wish to disclaim any responsibility for accounts which they understand have appeared in the British daily press describing the recent disturbances in Syria. They have not seen these reports, but learn that their names have been quoted in connexion with the care of casualties.